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Montana. Dept. of
Health and
Environmental
Environmental
impact statement
for the proposed
Lewis & Clark

LEWIS & CLARK COUNTY LANDFILL

FINAL

ENVIRONMENTAL IMPACT STATEMENT

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Prepared By:

Montana Department of Health and Environmental Sciences

January 1994

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DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES
DIRECTOR'S OFFICE

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1400 BROADWAY
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STATE OF MONTANA

(406) 444-2544 (OFFICE)
(406) 444-1804 (FAX)

HELENA, MONTANA 59620-0901

January 28, 1994

Ladies and Gentlemen:

Pursuant to the Montana Code Annotated 75-1-201 and the Administrative Rules of Montana, 16.2.634, the attached Final Environmental Impact Statement has been prepared by the Department of Health and Environmental Sciences in review of the proposed action of granting a Solid Waste Management System License for operation of the proposed Lewis & Clark County Class II Sanitary Landfill.

The purpose of the Final Environmental Impact Statement is to inform all interested governmental agencies, public groups or individuals of the proposed action and a description of the impacts the proposed action may have on the quality of the human environment. This Final Environmental Impact Statement includes copies of all public comments received by DHES on the Draft EIS document and the agency's responses to substantive comments. As required by ARM 16.2.635(5), a final decision will be made on the proposed action being reviewed in the Final EIS no earlier than 15 days from the release of this document. When the decision is made, a public Record of Decision will be issued.

Data, information, and explanations that were obtained by DHES subsequent to circulation of the Draft EIS document included the following items:

1. A letter containing written responses to public comments made on the Draft EIS by the Lewis & Clark Board of County Commissioners (Board of County Commissioners 1993).

2. A report of cost analysis and projections for the proposed Lewis & Clark County Sanitary Landfill (Site E) prepared by Damschen & Associates (July 14, 1993) for the Scratch Gravel Landfill District Board (see Appendix B of FEIS).

3. A submittal of an alternative liner design, *Alternative Liner Proposal Cell #1 Site "E" Lewis and Clark County, Montana*, prepared for Damschen & Associates by Huntingdon (Chen-Northern, Inc.), June 4, 1993.

CENTRALIZED SERVICES DIVISION (406) 444-2442
ENVIRONMENTAL SCIENCES DIVISION (406) 444-3948
HEALTH FACILITIES DIVISION (406) 444-2037
HEALTH SERVICES DIVISION (406) 444-4473

4. A letter from Blake Wordal (September 17, 1993) of the Lewis & Clark Board of County Commissioners stating the County's position on the potential regionalization of the proposed landfill, confirming the landfill acreage being applied for in the revised application (80-acres), and specifying acceptance of the conditions imposed by DHES (Wilbur 1993b) for acceptance of alternative liner submittal.

5. Letter from the Federal Aviation Administration (July 22, 1993) responding to questions from DHES (Wilbur 1993a) concerning location of landfills at Site E and Site A.

6. The contract between City of Helena and Waste Management of Montana, Inc. dated May 10, 1993 entitled SOLID WASTE TRANSPORTATION AND DISPOSAL AGREEMENT (see Appendix B of FEIS).

7. Letter from Mr. Ben Sale, owner of CCSS Landfill, to Kay McKenna, Mayor of City of Helena, concerning solid waste contract bid dated September 18, 1992 (see Appendix B of FEIS).

8. Telephone communication between K. Wallace, Woodward-Clyde Consultants, and T. Coston, Solid Waste Planner for Montana Rail Link, on July 20, 1993 and also communication with Dick Nesbit, City of Helena Director of Public Works, concerning rail transportation issues.

9. Telephone communications between J. Wilbur, MDHES, and Dan Martin, Supervisor of Data Collection & Analysis of the Montana Department of Transportation, on January 12 & 13 of 1994 and a pamphlet entitled "A Summary - Intermodal Surface Transportation Efficiency Act of 1991" distributed by the U.S. Department of Transportation .

10. Numerous references were checked or rechecked in regard to cost estimates for revision of Section 4.12 of the Draft EIS in the Final EIS and updates of changes in the fees charged by the City of Helena, City of East Helena, and the Scratch Gravel Landfill District for collection and disposal of solid wastes.

11. An article from the August, 1991 issue of Waste Age magazine entitled "Does a Landfill Bring Down Property Values?" by Donald Bleich, M. Chapman Findlay III, and G. Michael Phillips (pp. 55-58).

12. The revised ARM Title 14, Chapter 14 - Solid Waste Management, Subchapter 5 - Refuse Disposal, and Subchapter 7 - Ground Water Monitoring adopted in July, 1993.

13. Rule revision by the U.S. Environmental Protection Agency for Solid Waste Disposal Facility Criteria: Delay of Compliance and Effective Dates published in the October 1, 1993 issue of the Federal Register (Vol. 58, No. 189, pp. 51536 to 51548). This rule change delayed for six months compliance with some provisions of the Subtitle D rules for existing landfills that accept less solid waste than 100 tons per day.

There is no formal public comment period for the Final EIS being issued today. If governmental agencies, public groups or individuals wish to comment to the Department concerning this document they may; however, no written response will be made other than the public Record of Decision that was discussed above. The Department of Health and Environmental Science would like to thank all those who participated in this process by providing information and making comment.

Sincerely,

Robert J. Robinson
Director

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES

MARC RACICOT, GOVERNOR
FAX # (406) 444-1499

STATE OF MONTANA

OFFICE LOCATION: 836 Front Street, Helena, Montana
MAILING ADDRESS: PO BOX 200901, Helena, MT 59620-0901

M E M O R A N D U M

TO: All Interested Parties

DATE: February 4, 1994

FROM: Jon Dilliard, Solid & Hazardous Waste Bureau

SUBJECT: Errata for Lewis & Clark County Landfill Final Environmental Impact Statement, January 1994.

During the printing of the Lewis & Clark County Landfill Final Environmental Impact Statement (EIS) several references used in the text of the EIS were inadvertently omitted from Chapter 8.0 REFERENCES of the EIS.

Enclosed is an Errata which includes the omitted references to be inserted into the appropriate place in the document.

We apologize for the omission and any inconvenience it may have caused.

"AN EQUAL OPPORTUNITY EMPLOYER"

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ERRATA

For the Lewis & Clark County Landfill Final Environmental Impact Statement, January, 1994.

Please insert the following omissions:

Page 8-3 following the Damschen and Associates. 1993. citation:

Damschen, B. 1990a. Damschen & Associates. Letter to D. Marshall, Scratchgravel Landfill District Solid Waste Division Manager, re: License NODs. May 1.

Damschen, B. 1990b. Damschen & Associates. Letter to D. Marshall, Scratchgravel Landfill District Solid Waste Division Manager re: Leachate Collection. August 9.

Damschen, B. 1991a. Damschen & Associates. Letter to A. Grover, DHES, re: Response to NODs. April 17.

Damschen, B. 1991b. Damschen & Associates. Letter to Robert Johnson, Lewis & Clark County Health Officer re: Construction Cost Estimates. December 11.

Page 8-3 following the Frison, G.C. 1978. citation:

Gallagher, K. 1993. Draft Phase II Hydrogeologic Assessment Ben Sale Landfill East Helena, Montana. November 1.

FINAL

ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED LEWIS & CLARK COUNTY LANDFILL

January 1994

Montana Department of Health
and Environmental Sciences

Robert J. Robinson, Director

A Final Environmental Impact Statement (FEIS) has been prepared by the Montana Department of Health and Environmental Sciences (DHES) which evaluates Lewis & Clark County's proposal to construct and operate a Class II landfill in the vicinity of Helena, Montana. This summary of the Final EIS contains a description of the County's Proposed Action, alternatives to the Proposed Action, the affected environment, and potential impacts to the human environment resulting from implementation of the Proposed Action or one of the alternatives. If more information or greater detail is desired regarding the above elements of this summary, the FEIS should be reviewed as a whole. Copies of the Final EIS may be obtained by contacting one of the following persons:

Mr. Jon Dilliard
Manager, Solid Waste Program
DHES, 836 Front Street
Helena, MT 59620
(406) 444-1430

Mr. James Wilbur
Licensing Coordinator
DHES, 836 Front Street
Helena, MT 59620
(406) 444-1430

The Final EIS may be reviewed at the following Helena locations during normal business hours:

- DHES, Solid & Hazardous Waste Bureau, 836 Front Street
- City-County Health Department, Suite 207, Medical Plaza, 1930 9th Avenue
- Lewis & Clark Library, 120 S. Last Chance Gulch
- City-County Health Department, City-County Building, Room 409, 316 N. Park Avenue

S.1 SUMMARY OF PROPOSED ACTION

S.1.1 Project Background

In 1985 it became evident to Lewis & Clark County Commissioners and the Scratch Gravel Landfill District that existing landfill capacity would be reached within five years. Through a joint resolution of the City of Helena Commission and the Lewis & Clark County Commissioners, a Solid Waste Study Committee (SWSC) was formed to identify and evaluate long-term solid waste management alternatives for the City of Helena and southern Lewis & Clark County.

SWSC initially evaluated a 1981 resource recovery study prepared for the City of Helena. During this evaluation, the County asked ASARCO representatives to consider constructing a waste-to-energy (WTE) facility at the East Helena Smelter. ASARCO responded that such a facility was not feasible due to economic, environmental, and social considerations. SWSC subsequently concluded that this option was not feasible for Lewis & Clark County (Damschen & Associates 1987). SWSC then contracted with the engineering firm Damschen and Associates, to site a Class II solid waste landfill. The siting study was completed in two phases. The methodology, findings, and conclusions are documented in the Phase I and Phase II Reports (Damschen & Associates 1987 and 1990b, respectively). A brief summary of this work is provided below.

Phase I of the siting study was initiated in February 1987 with a meeting to present the public with the study's objectives and approach. Mandatory siting requirements and characteristics considered "fatal flaws" were identified at the onset. Sixteen potentially suitable candidate locations were identified. Further review led to the selection of eight candidate locations, Areas A through H. The candidate areas were rated by, (1) weighing each criterion to represent its significance, and (2) ranking the suitability of each area with respect to that criterion. From this analysis, Area E appeared to have the greatest suitability for a sanitary landfill, while Area G had the least. Subsequently, areas D, G, and H were eliminated from further consideration. Areas A, B, C, E, and F were carried into Phase II for further investigation.

Phase II began in January 1988. A site walkover to evaluate topographical, hydrogeological, transportation, aesthetic, and land use criteria was used in conjunction with existing soil and ground water information to delineate specific sites within each of the five candidate areas. Following a public meeting, held on September 28, 1988, a final ranking system was developed to rate each site. Site A ranked highest and Sites B and E ranked lowest. In January and February 1989, the owner of Site F decided not to sell his property, eliminating this site from further consideration. Adjacent landowners of Sites A and E changed their intentions of selling property to the County. This caused a shift in the Site A and E boundaries and, according to the Phase II analysis, altered their apparent suitability for landfill activities by decreasing the usable area of Site A and increasing the size and suitability of Site E.

In the final analysis, Site A ranked highest when ratings for the evaluation categories (environmental, sociological, economic) were combined. Upon review of these results, Site E was selected by SWSC as the first priority site, apparently because of the low purchase price for a much greater acreage, relative to Site A (Rasmussen and Macefield 1989) and Site A's location in an area believed to be a recharge zone of the Helena Valley Aquifer (Board of County Commissioners 1993). Another public meeting was held on August 23, 1989 to discuss these results.

S.1.2 Proposed Action - Alternative 1 (Site E)

The Proposed Action, which consists of siting a landfill at Site E, is planned as a replacement for the Helena Landfill and the Scratch Gravel Landfill. Only Phase I of the proposed landfill, which includes 80 acres of the total original 189 acres planned for use as a landfill, was evaluated. (Additional environmental analysis would be required for licensing of landfill acreage beyond Phase I.) The proposed action of licensing an 80-acre landfill at Site E would be expected to provide a solid waste disposal facility for the residents of Helena and the Scratch Gravel Landfill District, and possibly East Helena, for approximately 50 years.

Although plans for the facility have undergone significant modification since the first license application was submitted to DHES, the facility has been designed with engineering controls to protect environmental resources. The facility would be owned by Lewis & Clark County and operated by the Scratch Gravel Landfill District, an administrative subunit of the county. The District would continue to provide management of solid waste for the southern portion of Lewis & Clark County, and incur the debt necessary to construct, operate, and eventually close the landfill.

Site E is approximately ten miles northeast of Helena in the northeast 1/4 of Section 32, Township 11 North, Range 2 West (Figure S.1-1). Lake Helena Drive is 3/4 mile to the west, York Road and additional land is south of Site E, and Deal Lane borders the site to the north. The entire parcel of land purchased by the County consists of approximately 320 acres.

S.1.3 License Application

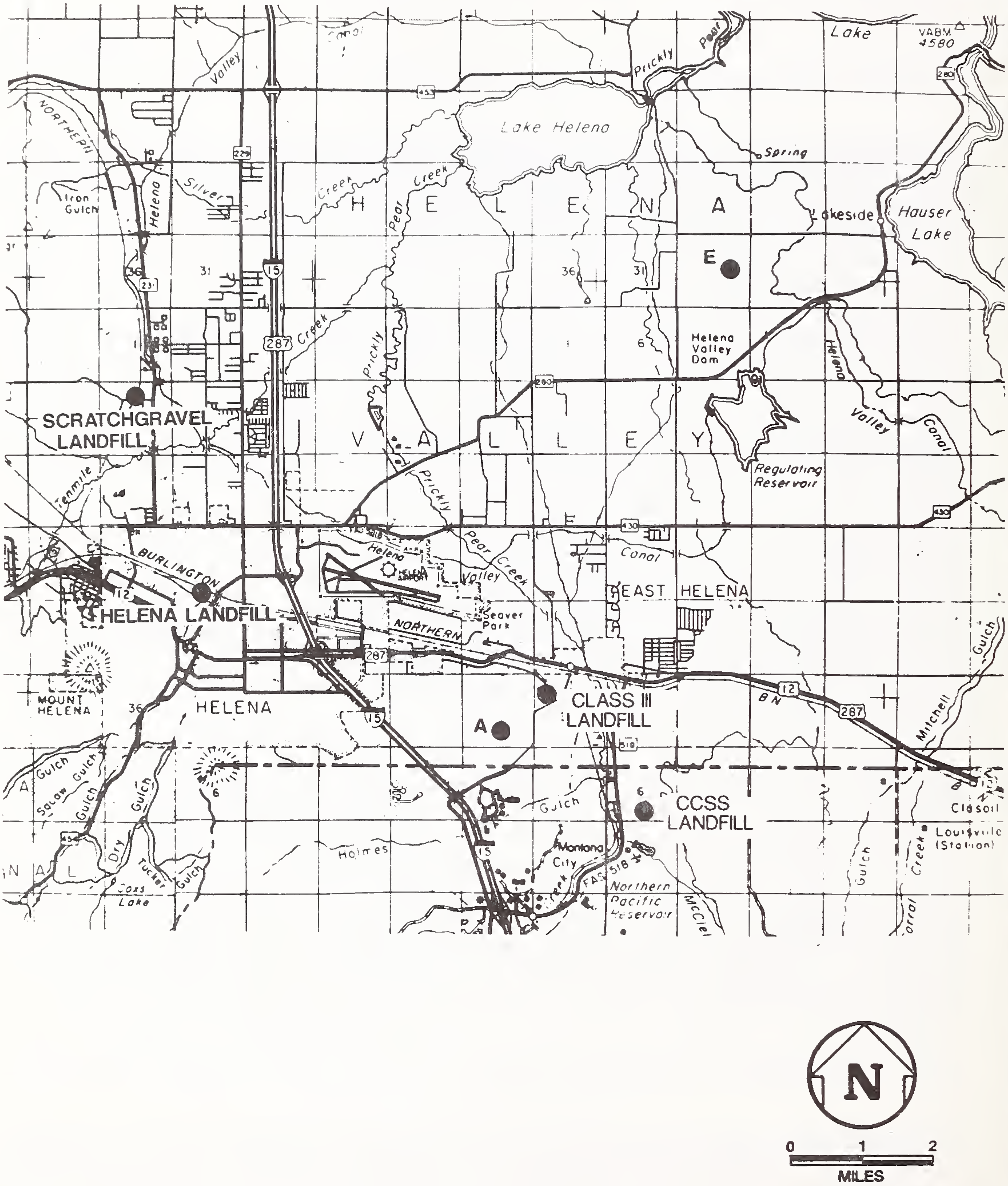
The Class II Sanitary Landfill Operation Plan and License Application was submitted in March 1990, to DHES by the Scratch Gravel Landfill District Board (Damschen & Associates 1990a). This document included application information, preliminary design drawings, summary of the site hydrogeology including soil and ground water conditions, and leachate migration potential. The proposed operating plan described the development of the landfill in three phases, only the first of which (consisting of 80 acres) is included in the current application. It also included plans for ground water monitoring, waste transportation, landfill operation, and landfill design.

The District Board was notified by DHES that the application was incomplete in April 1990, and more information would be required to process the application. An on-going response was submitted to DHES in May, August, and November, 1990 that included a reduction in acreage applied for, additional design, and hydrogeological information. DHES held a public informational meeting to explain the modifications to the original application and to receive comments concerning the application in January 1991. A second notice of incompleteness was issued by DHES in March 1991, with follow-up responses supplied by the County in the ensuing months.

DHES issued an environmental assessment (EA) for the proposed landfill at Site E in September 1991 (Montana DHES 1991). The purpose of the EA was to evaluate the overall impact of the proposed landfill on the human environment, in accordance with the Montana Environmental Policy Act (MEPA), and DHES rules implementing MEPA. An extended public comment period was held for the EA and a public hearing was held during this comment period in October 1991. The findings of the EA met with significant opposition from the public. County officials expressed concern about the adequacy of the EA to assess potential environmental impacts. DHES subsequently determined that an EIS would be necessary. DHES and their consultant began the EIS in June 1992. A draft EIS document was issued by DHES in April 1993 with an extended public comment period following, which included a public hearing held on May 17, 1993.

S.2 LEAD AGENCY AND THE EIS PROCESS

The Montana Environmental Policy Act (MEPA) requires that if an action taken by the State of Montana "might significantly affect the quality of the human environment" an EIS must be prepared. DHES became committed to development of an EIS when the "significance" criterion was established during the license application review. The Department rules implementing MEPA outline mandatory requirements of the EIS, including issues identification during a public and agency scoping process, development of alternatives to the Proposed Action, description of potentially affected environmental resources, and an analysis of extent of environmental impacts caused by the Proposed Action or alternatives.



SOURCE: DAMSCHEN & ASSOCIATES 1987 AND 1990b

Job No. : 23050E

Prepared by : K.W.

Date : 3/23/93

EXISTING AREA LANDFILLS AND EIS ALTERNATIVE SITES

FIG. S 1-1

The Department of Health and Environmental Sciences is the lead agency responsible for preparation of the EIS. Interdisciplinary technical expertise was provided by a third-party consultant under the direction of DHES. DHES will consider the Proposed Action and alternatives presented in the EIS, and issue a decision on the licenses and/or approvals required to proceed with siting, construction, and operation of a Class II landfill in Lewis & Clark County. DHES may approve the application as submitted or with stipulations, deny approval, or approve a modification of the Proposed Action or an alternative action.

S.3 DEVELOPMENT OF ALTERNATIVES

MEPA requires that the lead agency consider the environmental effects of the Proposed Action[1] and the "No-Action" alternative. The Proposed Action is the request by Lewis & Clark County for DHES to license a Class II landfill at Site E, northeast of Helena. The No-Action alternative is essentially a denial of the County's license application with no provision for an alternative action.

DHES held a public scoping meeting on June 11, 1992 in Helena to identify issues and concerns related to the Proposed Action. Comments, suggestions, and concerns about the project and the EIS were gathered. Written comments were received during the scoping meeting and later during the thirty-day scoping period following the meeting. Another scoping meeting was held on June 22, 1992 in Helena to solicit comments and concerns about the Proposed Action from various resource agencies. A less formal meeting was held in September, 1992 at DHES offices to discuss potential alternatives to the Proposed Action.

DHES evaluated public comments and concerns raised during the scoping process, and during the many public forums conducted prior to initiation of the EIS, and determined that the following alternatives would be evaluated in the EIS:

- Alternative 1 - Proposed Action (Site E)
- Alternative 2 - Site A
- Alternative 3 - City-County Sanitation Service (CCSS) Landfill
- Alternative 4 - Modification to the Proposed Action
- Alternative 5 - No Action

The primary concern was about the proposed location of the landfill at Site E. In response to these concerns, two alternatives with different potential landfill locations, Site A and the CCSS Landfill, were evaluated in the EIS. Comment was also received encouraging the use of waste management practices which would reduce or minimize the amount of material requiring landfilling.

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[1] The Proposed Action to operate a landfill at Site E is considered, for the purposes of this environmental analysis, an alternative. MEPA and DHES rules implementing MEPA require a consistent, comparable analysis of the Proposed Action and alternative actions. Designation of the Proposed Action as an alternative will help to assure that environmental impacts associated with the various sites are evaluated in as uniform and consistent a manner as possible.

Alternative 4 was established to consider various waste handling processes, including recycling and composting. Alternative 5 is a statutory requirement. The alternatives are evaluated in detail in the EIS for potential impacts to various environmental resources (wildlife, soils, vegetation, water, and related topics) and human resources (socioeconomics, visual resources, and related topics). Other alternatives were suggested or considered during preparation of the draft EIS, but dismissed from further consideration for any of a number of reasons. Some alternative sites were geologically unsuitable and did not meet the Subtitle D siting criteria. Other sites, while meeting minimum siting criteria, may not have offered any advantages over Sites A, E, or the CCSS Landfill. Also, some sites were apparently not available for purchase. Finally, it should be noted that the County's plans for Site E in the original application did not meet some of the minimum design criteria set forth in Subtitle D, since the final federal rules were not promulgated until after plans for Site E were developed. The Draft Environmental Impact Statement (DEIS) points out the design deficiencies; no license would be issued for Site E or the alternative sites without a plan for design which meets applicable minimum federal and state requirements for solid waste disposal facilities. Since publication of the DEIS the County has modified the liner design for compliance with the Subtitle D performance standard.

Alternatives 2 through 5 are briefly described below. A description of the Proposed Action, Alternative 1, was included in Section S.1.2.

S.3.1 Alternative 2 - Site A

Site A is located approximately one mile southwest of East Helena and the ASARCO smelter (Figure S.1-1). This site consists of about 80 acres which begin at the Lewis & Clark County and Jefferson County line, near the upper end of a drainage approximately 1/2 mile northeast of Interstate 15. The property follows the drainage in a northeasterly direction. The land has been used for agricultural purposes, but a subdivision is located approximately 2/3 mile south of the site. It is assumed that ground water flows in a northeasterly direction, toward Prickley Pear Creek and following the general trend of the Helena Valley Aquifer.

Site A ranked as one of the top alternatives in the siting study. There was strong public opposition to this site, however, when the County first recommended it as a candidate for the new landfill during public hearings. Additionally, it was noted in the scoping phase of this EIS that there was an inequitable amount of site-specific hydrogeological data available for this site. This data gap suggested that it would be difficult to provide comparable levels of impacts evaluation for all of the alternatives. To help correct the data deficiency DHES drilled a test boring at Site A in December, 1992. Field data collected include water level measurements, conductivity analyses, pH, and description of the subsurface conditions down to approximately 100 feet.

S.3.2 Alternative 3 - CCSS Landfill

The CCSS Landfill is located in the north 1/2 Southeast, 1/4 Section 6, Township 9 North, Range 2 West, Jefferson County, Montana (Figure S.1-1; this facility is also known as the "Tenneson" or "City-County" Landfill). The facility, currently in use as a solid waste landfill, is approximately 1 1/2 miles south of the community of East Helena off Highway 518. DHES issued a license for this Class II facility on January 19, 1988. It serves both commercial and residential customers on a total area of 140 acres, of which 60 acres are licensed for landfill use. The CCSS operating license would have to be modified for the facility to receive approval to dispose the much larger waste stream from Helena and the Scratch Gravel District. The facility is not currently in compliance with Subtitle D regulations. Although a preliminary plan for modification of the landfill was developed in 1993, significant upgrades would be necessary for this facility to continue to operate under the new rules. Also for this facility to accept the projected volume of waste considered in this action, it must modify its license with proper administrative review and public input.

Donna Tenneson recently sold this facility to Ben Sale Trucking. The new owners are reportedly interested in expansion of the facility in order to accept Class II waste from Lewis & Clark County and other areas. Ben Sale held an informational meeting for the public in East Helena on February 4, 1993 to describe his plans for site development. Although no design has been submitted to DHES for review or action, the new owner did present at the meeting an outline of preliminary design features for facility expansion, which include a 2-foot compacted clay liner overlain by a synthetic liner, leachate collection systems, and apparently all other engineering systems and controls necessary to fully conform with minimum requirements of Subtitle D.

CCSS Landfill was not included in the Damschen & Associates siting study. However, its use for future long-term management of Lewis & Clark County's solid waste has been supported by some members of the public throughout the scoping process. Others, particularly those residing in or near East Helena, are strongly opposed to further expansion of the facility. Jefferson County has apparently sought to prohibit Lewis & Clark County's use of this facility by issuance of an emergency zoning ordinance limiting the expansion of the CCSS facility; in other words, preventing the facility from accepting waste other than that which it is already licensed to dispose.

One argument for consideration of the CCSS facility as an alternative involves privatization. In light of today's solid waste regulations which impose aggressive implementation schedules, municipalities often cannot afford to finance new waste management infrastructures. In addition, local governments need to minimize the risk associated with landfill management. The private sector is able to make a profit from taking on this risk, and has access to private sector funds for short-term and long-term financing. Therefore, a public-private partnership can create an environment in which responsibilities can be assigned to the parties best able to deal with them. In addition, the Montana Solid Waste Management Act encourages the use of private industry to the maximum extent possible in planning, designing, managing, constructing, operating, manufacturing, and marketing functions related to solid waste management systems.

S.3.3 Alternative 4 - Modification to the Proposed Action

This alternative would serve to modify, rather than mitigate, the Proposed Action or the other site alternatives. Recommended modifications include several waste management processes and combinations of processes. The objective of this alternative would be to prolong landfill life, reduce costs, and comply with recent Montana legislation. Various methods were initially considered, with the EIS analysis limited to recycling and composting. Recycling and composting are processes which are not limited to any of the alternative landfill sites, but could be implemented with approximate ease at each facility.

Both the Montana Solid Waste Management Act and Integrated Waste Management Act place a priority on recycling and composting. The latter has established a goal of reducing the volume of waste landfilled (or incinerated) by 25 percent between 1991 and 1996. In addition, MEPA requires the State to "enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources" [Section 75-1-103(2)(f), MCA]. Co-composting of sewage sludge with leaves, branches, and grass was investigated by the County (Marshall 1990c). It was ultimately decided that composting would not occur at the proposed Site E (Damschen & Associates 1991a). During the scoping process, however, several requests were made by the public to include alternative waste management processes including recycling and composting in the EIS process. Additionally, the City-County Health Department and the Helena Citizens Council have been pursuing composting options over the last few months.

Recycling would reduce the amount of waste requiring land disposal, and can be implemented in addition to landfill operation. It is probably most efficient if operated at, or in close proximity to, the landfill or a transfer facility. Recycling systems are usually environmentally benign. Success, however, is dependent upon market availability for the recycled product. Typical recyclables with a reliable market today include aluminum, paper, some cardboard products, and some plastics. The City of Helena recently began curbside collection of recyclables for city residents. In addition, plans have been developed for a drop-off program at the transfer station, which is licensed for operation near the location of the existing City Landfill (Damschen & Associates 1991a).

Composting helps to speed biodegradation of organic materials by providing moisture and oxygen for bacterial action. This process can provide a volume reduction of 40 to 60 percent. There are a number of different composting methods. A windrow system is the most likely to be implemented by the County due to low capital costs and O&M requirements. Odor and leachate generated from these systems must be carefully controlled; these are particular problems for systems using sewage waste. A composting operation incorporating sewage sludge or any materials other than "yard waste" would require a separate license from DHES.

S.3.4 Alternative 5 - No Action

In accordance with MEPA policy and significant precedent, the No Action alternative must be fully evaluated in the EIS. No Action for Lewis & Clark County could be interpreted to mean expansion of one or both of the existing Class II landfills, if possible, or export of the County's waste. The first possibility would require further development of existing facilities with significant upgrades and licensing efforts. However, there is very little capacity at either of the area landfills, and each has problems with environmental contamination. The export option may require intergovernmental cooperation which may present some logistical or political obstacles, not to mention the escalated cost to ratepayers to ship and dispose refuse outside the area in which it is generated.

The No Action scenario for this EIS is unique, at least with respect to most MEPA evaluations. No Action typically signifies disapproval of a license application or proposed action, without implementation of an alternative action. However, the practical result of a No Action alternative in this situation is a delay from decision making, and possibly further deterioration of ground water resources. Some action will be necessary to properly manage the solid waste currently being disposed.

S.4 SUMMARY OF AFFECTED ENVIRONMENT

The landfill site proposed by Lewis & Clark County and each of the alternative sites are located east of the City of Helena, in the Helena Valley of west-central Montana. The Helena Valley is an intermontane basin in the north-central portion of the Northern Rocky Mountains physiographic province (Briar and Madison 1992). The study area for this EIS lies within the Helena Valley. The study area is generally bordered by the Missouri River and various reservoirs to the east and north, Interstate 15 to the west, and the Boulder Batholith (a large igneous rock intrusion) to the south.

Since the Valley is semi-arid (approximately 12 inches of precipitation per year), agriculture includes both irrigated and dryland production of forage and grains such as wheat, barley, and oats. Much of the Valley is rangeland consisting of grassland, which is used for livestock grazing. These grasslands are mixed with pine and fir trees in upland areas. Grassland soils consist of alluvial mollisols, inceptisols, and entisols. These are primarily loamy soils with some gravel and clay components, formed on alluvial fans, stream terraces, and uplands. Of course, many areas of the Valley have been developed for housing, and are productive for neither grazing or farming.

The relative proximity of the alternative sites within the Valley (within approximately seven miles or less of each other) allows generalized descriptions of many of the natural resources to be applied to all of the sites. For instance, many wildlife species are common to all of the sites, and the natural vegetation is generally similar. The climate for each of the sites is similar, if not very nearly the same. However, other resources such as surface water and recreation are site-specific and require separate description in the affected environment for each site alternative. For instance, air quality may vary at each site due to the presence of industrial sources, population density, and road traffic.

S.5 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

The Proposed Action and landfill site alternatives were evaluated for their potential impacts on a number of environmental resources. Alternative 4 was evaluated for selected impacts which would represent a change in effect from the standard landfill operation alternative. For instance, a recycling and composting operation should not have any additional effect on area vegetation, but composting may contribute to an increase in area odor levels if appropriate control measures are not employed. Alternative 5, the No Action alternative, was assessed for socioeconomic impacts only, since there would be no waste disposed at area facilities or additional land disturbed in the study area.

Some impacts resulting from development of a new landfill in the Study Area are common to all of the landfill site alternatives. For instance, residents and businesses in Helena and the Scratch Gravel Landfill District would see an increase in the rates charged for refuse disposal in order to fund the construction and operation of a new landfill, or even to export waste to Great Falls or Missoula. Landfill construction at Sites E or A, or expansion of the CCSS facility, would cause some local degradation of air resources due to particulate emissions. A beneficial impact of most alternatives would be that the Scratch Gravel and Helena Landfills, each of which has a problem with ground water contamination, would be closed and prohibited from accepting additional waste. A summary of the key results of the impacts evaluations follows, with emphasis on those impacts unique to each site.

S.5.1 Alternative 1 - Proposed Action (Site E)

As with any of the alternative landfill locations, the proposed Site E landfill must be designed and constructed to comply with Subtitle D and state requirements. Design features, including a composite bottom liner, leachate management, and final cover will reduce the potential for ground water contamination. If contamination were to occur, downgradient private wells could be impacted. Ground water monitoring systems should, however, detect contamination long before it becomes a concern to private water sources. Corrective actions would be taken to prevent migration of ground water contamination away from the site. Surface water protection would come from runon control systems designed to reduce overland flow onto the site, and runoff control systems engineered to prevent the off-site release of contaminated water.

Some soil loss would likely occur due to construction activities, and productivity would be reduced because of soil loss and compaction. Reclamation could restore and enhance soil productivity over the long term. Modifications in soil productivity could alter or impact vegetative species composition and productivity. Landfill operations would remove vegetative cover, although reclamation of landfill cells as they are closed would help stabilize soils and restore native vegetation. Weed infestation is likely to occur without implementation of a weed control program. Reductions in vegetative cover, activity at the facility, and security fencing would displace antelope. "Nuisance" species (gulls, ravens, rats, skunks, etc.) may be attracted to the facility and their local populations could increase. A commitment to refuse compaction and covering, and control of blowing litter, would help minimize problems with nuisance animals. Bald eagles and peregrine falcons either nest or frequent areas close to Site E. Increases in rodents or other nuisance species could entice particularly eagles to frequent the area for the more readily available food source. Again, mitigations to cover and control refuse, already incorporated into the Site E plans, would reduce this concern.

An historic site at Site E may be permanently affected by use of the property as a landfill. The site may include a building, farm debris, and a road or trail, and irrigation ditch. Traffic would increase by a relatively small percentage on roads leading from the Helena Solid Waste Transfer Station to Site E. Traffic increases range from less than 1/2 percent within the Helena city limits to approximately 6 percent on York Road and Lake Helena Drive, up to about 12.5 percent on Deal Lane. Traffic increases would also result in an increase in the risk and rate of accidents along the haul route. An increase in noise levels would be apparent to residences located immediately near the site. Land use would change at Site E, from dryland farming to industrial. Adjacent land uses would not necessarily be impacted. Visual effects would not be widespread, but nearby residences would have clear views of the proposed landfill as would motorists on Deal Lane. Blowing litter is a common problem with landfills. Litter fencing would help to reduce this problem.

S.5.2 Alternative 2 - Site A

Site A, if licensed, would be designed and constructed to comply with Subtitle D requirements. Design features including a bottom liner, leachate management, and final cover would help reduce the potential for ground water contamination. There are no residential wells immediately located in the direction presumed to be downgradient from Site A, however, residential wells do exist in a downgradient direction. Because Site A would be located in an intermittent drainage, a runon diversion system would be needed at the upgradient and lateral directions of the facility to channel runon to the downgradient site. A detention pond or other measures for flow control could be needed at the downgradient boundary.

Some soil loss would likely occur due to construction activities, and productivity would be reduced because of soil loss and compaction. Reclamation could restore and enhance soil productivity over the long term. Modifications in soil productivity could alter or impact vegetative species composition and productivity. Landfill operations would remove vegetative cover, although reclamation of landfill cells as they are closed would help stabilize soils and quickly restore native vegetation. Weed infestation is likely to occur without implementation of a weed control program. Reductions in vegetative cover, activity at the facility, and security fencing, would displace to some extent antelope which use the area for winter range. "Nuisance" species (gulls, ravens, rats, skunks, etc.) may be attracted to the facility and their local populations could increase. A commitment to refuse compaction and covering, and control of blowing litter, would help minimize problems with nuisance animals. Bald eagles and peregrine falcons are less proximal to Site A than Site E, but they are still potentially susceptible to impact by the landfill operations, particularly if refuse is not covered quickly or nuisance species increase.

Traffic would increase by a relatively small percentage on roads leading from the Helena Solid Waste Transfer Station to Site A. Traffic increases range from less than 1/2 percent along any of the three haul route scenarios considered, except that traffic on Smelter Road would increase by approximately 4 percent. The routes considered for waste trucks to travel from the transfer station to Site A do contain a number of locations which already experience traffic congestion. Additional truck traffic related to waste haulage would only exacerbate this problem. From 3 to 15 high-accident locations are encountered, depending on the haul scenario used. The risk and rate of accidents would increase.

Land use would change at Site A, from dryland farming or grazing or fallow pasture, to industrial. Adjacent land uses would not necessarily be impacted. Visual effects should not be widespread as intervening topography blocks views of most of the site from residential areas. Motorists on Smelter Road would have the most direct view of the site. Blowing litter is a common problem with landfills. Litter fencing would help to reduce this problem.

Portions of Site A are within 10,000 feet of an active runway of the Helena Airport, which raises a concern that increased bird activity, attracted by the landfill, may interfere with flight operations. The Federal Aviation Administration has substantial authority to review and comment on the approval or denial of a permit for a landfill this close to an active runway. It is possible that the FAA would not allow a municipal landfill to be operated at Site A.

S.5.3 Alternative 3 - CCSS Landfill

The CCSS Landfill is an existing, operating solid waste disposal facility. Use of the CCSS Landfill for waste from the Scratch Gravel District and Helena would necessitate an extensive expansion of facilities. A preliminary design outline for an upgraded landfill at the CCSS facility (Blue Ridge Services 1993), unassociated with this project, does include a composite liner and a leachate collection system, but no engineered designs have been submitted yet. Any significant expansion of the annual capacity of this facility that would be necessary to accept the wastes from the projected service area of the proposed action would require upgrade of facility systems to comply with Subtitle D and license modification.

Design features, including a composite bottom liner and leachate management system, will help reduce the potential for ground water contamination. There are no residential wells immediately located downgradient direction from the CCSS site, although residential wells do exist in a downgradient direction. The closest residential wells are directly west of the site, and approximately 1/4 mile southwest of the site. However, ground water flows in a regional-trending, northwesterly direction from the CCSS site, which is located near the upgradient boundary of the Helena Valley Aquifer.

Runon and runoff controls would be used to prevent contamination of surface water and off-site migration of contaminated water. Some soil loss would likely occur due to construction activities and productivity would be reduced because of soil loss and compaction. Reclamation could restore and enhance soil productivity over the long term. Modifications in soil productivity could alter or impact vegetative species composition and productivity. Landfill operations would remove vegetative cover, although reclamation of landfill cells as they are closed would help stabilize soils and quickly restore native vegetation. Weed infestation is likely to occur and continue at the CCSS Landfill without implementation of a weed control program. Reductions in vegetative cover, activity at the facility, and security fencing would displace to some extent antelope which use the area for winter range. "Nuisance" species (gulls, ravens, rats, skunks, etc.) may be attracted to the facility and their local populations could increase. A commitment to refuse compaction and covering, and control of blowing litter, would help minimize problems with nuisance animals. Bald eagles and peregrine falcons are less proximal to CCSS Landfill than Site E, but they are still potentially susceptible to impact by the landfill operations, particularly if refuse is not covered quickly or nuisance species increase. However, no adverse impact to bald eagles or falcons has been documented as a result of current operations.

Traffic would increase by a relatively small percentage on roads leading from the Helena Solid Waste Transfer Station to the CCSS Landfill. The haul route would follow a similar path as that used for Site A, except trucks would continue through East Helena, past the ASARCO Smelter, and turn south on Highway 518 to the landfill access road. Traffic would increase by up to approximately 1 1/2 percent. Potential problems with traffic congestion and accident risk would be similar to those described for Site A.

Land use would more quickly be converted from dryland farming to industrial, but the CCSS site is already a municipal landfill and the relative impact of the change would not be as great as for either Site E or Site A. Adjacent land uses would not necessarily be impacted; the potential for residential development north of the site is probably already limited due to possible contamination from area industrial emissions. Visual effects would not be widespread as the trenches and intervening topography block views of most of the site from residential areas. However, expansion of the facility to the west could expose residents south and west of the facility, and motorists on Highway 518, to views of landfill operations. The Kleffner Ranch, a residence possibly eligible for historic designation, is located west of the CCSS Landfill in the expansion viewshed. Blowing litter is a common problem with landfills. Litter fencing would help to reduce this problem.

S.5.4 Alternative 4 - Modification to the Proposed Action

The primary impacts associated with this waste management alternative are beneficial. Waste recycling and composting reduce the amount of refuse going into a landfill, thereby extending the life of the facility and reducing capital expenditures. Of course, recycling also provides other positive environmental benefits to society by reducing energy used for production processes, and minimizing extraction of raw materials. Some other local environmental consequences of this alternative are described.

A composting facility would probably generate wastewater, which could probably be managed using retention and settling pond(s), much as the leachate collected from the landfill cells. A low-permeability pad could also be needed to prevent wastewater from percolating into the ground. Recycling stations can be noisy, especially as a result of glass handling and crushing, and compaction of aluminum. It is assumed that recycling would take place at the Helena Transfer Station. Composting at the landfill would probably not increase noise levels above those associated with the heavy equipment used in waste placement and cover. Proper operations and use of control measures would be needed to minimize odor from the composting operations, caused by natural degradation of organic compounds.

Helena and the Scratch Gravel District have recycling programs which would likely be continued with a new landfill. Recycling can generate revenue, but at present a private vendor is being used for storage, handling, and transfer of materials, so the immediate economic exchange is probably at a loss to the governments. However, the economic savings realized by limiting landfill usage to only non-recyclable materials can be significant due to the increase in landfill life.

The cost of starting and operating a composting facility can be significant, especially if composting is the primary solid waste disposal method. However, a supplemental composting program, used in conjunction with a landfill operation, can be simple and relatively economical. Nationally, the cost of composting is usually less than landfill tip fees, and there are lower environmental impacts and less environmental liability. The most significant economic impact would be the cost avoided by not landfilling yard wastes, thereby extending the life of the landfill. The EIS estimates that approximately 2,000 to 4,000 tons per year of yard waste alone could be processed for composting. This mass accounts for approximately 10 per cent of the material to be landfilled, meaning that the landfill life could be extended by approximately 9 years at Site E.

More complicated composting systems can be developed which degrade other wastes, including using sewage sludge to assist in microbial processes. A separate license would be required for a composting facility which used anything other than yard waste materials as a substrate. This type of system was not evaluated as a viable method in the FEIS, primarily due to the limited demonstration of effectiveness and efficiency in this region. Also, concerns over noise, odor, and leachate management would be significantly greater.

S.5.5 Alternative 5 - No Action

Section S.3.4 of this Summary described the No Action alternative and the immediate practical impacts of this decision, namely that solid waste generated in the study area would have to be transported to a licensed facility outside the region, or an expansion of the Helena or Scratch Gravel facilities would have to be approved, allowing a capacity increase at one or both landfills. Because of space constraints, high costs for upgrade, and contamination of ground water at both facilities, it is believed that licenses would be denied for expansion of either the Helena or Scratch Gravel Landfills.

Both Great Falls and Missoula have large, privately owned and operated landfills, which would likely contract to dispose Helena-area waste. According to DHES officials, both counties have granted permission to their area facilities to accept waste from Lewis & Clark County and Helena. Currently the City of Helena has a short-term contract (2-year) with the High Plains Landfill near Great Falls for disposal of waste from the City of Helena Solid Waste Transfer Station and is currently utilizing this disposal option.

The EIS does not provide a separate analysis of the No Action alternative for each environmental resource, because the No Action alternative essentially maintains the baseline environmental conditions described in Chapter 3.0. The EIS does include an evaluation of the economic impacts of transporting solid waste from the Helena area by truck to the Great Falls site. The cost analysis found in Section 4.12 of the EIS shows that annual costs to dispose waste outside the Helena Valley region would likely be comparable to those required to construct and operate a facility within the region.

S.6 DHES PREFERRED ALTERNATIVE

DHES considered the environmental and social consequences of siting a landfill at the locations considered in Alternative 1 (Site E, the Proposed Action), Alternative 2 (Site A), and Alternative 3 (CCSS Landfill), and for denial of the license application (No Action), which would result in either continued use of existing area landfills or transporting waste to a licensed facility outside the Helena Valley. In addition, the Department considered the benefits associated with a modified proposed action which would incorporate recycling and/or composting into the landfill operations (Alternative 4, Modification to the Proposed Action). The Department's preferred alternative is Alternative 4, with the use of recycling and composting being incorporated as much as reasonable, since it would reduce the volume of wastes requiring land disposal, and thereby also help to meet national and state goals for waste reduction, reuse, and recycling.

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ADT	Average daily trips
BGS	Below ground surface
BHES	Board of Health and Environment Sciences
BLM	Bureau of Land Management
CCSS	City-County Sanitation Service
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (Federal Superfund law)
CF	Cubic feet
CFR	Code of Federal Regulations
CM/SEC	Centimeters per second
CM^2/SEC	Centimeters squared per second
CY	Cubic yard
DEIS	Draft Environmental Impact Statement
DFWP	Department of Fish, Wildlife, and Parks
DHES	Department of Health and Environment Sciences
DSL	Department of State Lands
EA	Environmental Assessment
EIS	Environmental Impact Statement
°F	Degrees Fahrenheit
FEIS	Final Environmental Impact Statement
FT	Feet
GAL	Gallon
GPD	Gallons per day
GPM	Gallons per minute
HNF	Helena National Forest
LOS	Level of Service
MAQB	Montana Air Quality Board
MCL	Maximum Contaminant Level
MDOT	Montana Department of Transportation
MEPA	Montana Environmental Policy Act
MPH	Miles per hour
NEPA	Natural Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
O&M	Operation and maintenance
POC	Point of compliance
RCRA	Resource Conservation and Recovery Act
Subtitle D	That part of RCRA applying to solid waste management (Also discussed as 40 CFR Part 257 and 40 CFR Part 258)
SWMP	Solid Waste Management Program (of DHES)
SWSC	Solid Waste Study Committee
TPD	Tons per day
TPY	Tons per year
W-T-E	Waste-to-energy
μmhos/cm	micro mhos/centimeter, a measure of conductiveness

1.0
INTRODUCTION

1.0
INTRODUCTION

This Final Environmental Impact Statement (FEIS) discloses the possible environmental consequences of siting and operating a proposed Class II Sanitary Landfill in Lewis & Clark County, Montana. The proposed action, and alternatives formulated by regulatory officials from the Montana Department of Health and Environmental Sciences (DHES), have been carefully evaluated in consultation with a 3rd-party consultant and technical specialists from other state and federal agencies. Environmental issues and concerns expressed by the public during project scoping have been considered and incorporated into this analysis.

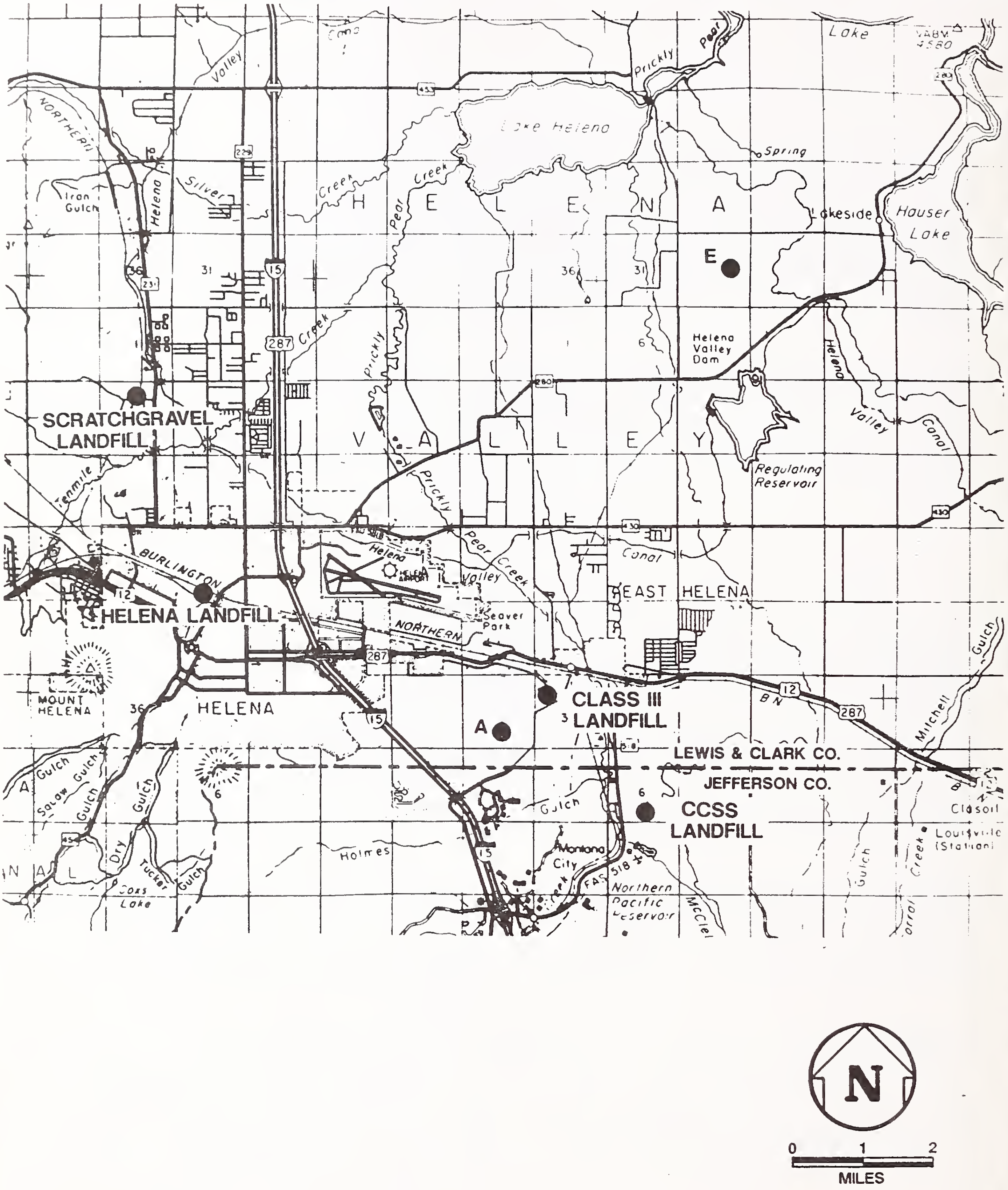
This chapter of the FEIS includes: (1) a description of the proposed landfill siting action, (2) an explanation of the purpose and need for preparation of the EIS, (3) a summary of the steps taken in the EIS process, including regulatory requirements for public participation, (4) a guide to the authority and statutory responsibilities of the various agencies which have a role in the environmental analysis or licensing decision, and (5) a summary of the issues and concerns expressed by the public during project scoping.

1.1 PROPOSED ACTION: LOCATION AND BACKGROUND

The Scratch Gravel Landfill District, a political subunit of Lewis & Clark County (the project "Proponent"), has applied to the State of Montana for a license to operate a Class II sanitary landfill (Damschen & Associates 1990a). The landfill would serve as a solid waste disposal facility for the cities of Helena and East Helena and the Scratch Gravel Landfill District of Lewis & Clark County for approximately 50 years (the Scratch Gravel District generally encompasses the southern portion of Lewis & Clark County). As a Class II facility, the landfill could accept non-hazardous Group II wastes (organic and mixed solid) and Group III wastes (wood and insoluble, inert solid). Asbestos could be disposed under special conditions in a separate area of the facility.

The proposed site for the landfill, known as Site E, is approximately ten miles northeast of Helena in the northeast 1/4 of Section 32, Township 11 North, Range 2 West (Figure 1.1-1). The Site E parcel is located about 3/4 mile east of Lake Helena Drive, between York Road and additional land on the south, and Deal Lane on the north. The Proponent has applied for a 80 acre disposal area (called phase I) within the 320-acre parcel which would be used as a landfill.

At present there are two Class II sanitary landfills in southern Lewis & Clark County. One, the Helena Landfill, is located within the Helena city limits on land leased from Burlington Northern Railroad. This site is between the Bill Roberts Golf Course and Carroll College, just east of Benton Avenue. The Helena Landfill is operated by the City and accepts waste generated by residential and commercial users in Helena, in East Helena, and at Fort Harrison, in addition to accepting waste from self-haulers and non-residents. The other Class II landfill, known as the Scratch Gravel Landfill, serves residents in the southern part of Lewis & Clark County. This facility is in the southern part of the County, at the base of the Scratchgravel Hills near Franklin Mine Road, in the West Helena Valley. It is operated by the Scratch Gravel Landfill District. Locations of both facilities are marked on Figure 1.1-1.



SOURCE: DAMSCHEN & ASSOCIATES 1987 AND 1990b

Job No. : 23050E	EXISTING AREA LANDFILLS AND EIS ALTERNATIVE SITES
Prepared by : K.W.	
Date : 3/23/93	

FIG. 1.1-1

The proposed landfill would replace both the City landfill and the County's Scratch Gravel landfill, because both facilities are near the end of their operational life. In addition, a new sanitary landfill would incorporate engineering features designed to provide better environmental protection than either of the existing facilities. The new landfill would be operated by the Scratch Gravel Landfill District, which is an administrative subunit of the County. This District would continue to provide management of solid waste for the southern portion of Lewis & Clark County. The District would incur the debt necessary to construct, operate, and eventually close the new landfill, and would also collect the sanitation fees necessary for debt service.

In 1985, a task study committee was formed to update findings and conclusions of a Resource Recovery Study for the Helena area that had been prepared in 1981 (Systech Corporation 1981). Alternatives for waste-to-energy processes and waste incineration were evaluated and deemed not economically viable. A further conclusion was that a solid waste landfill would still be needed regardless of the alternatives considered, because of the need to dispose noncombustible waste and combustion residue (City-County Solid Waste Study Committee 1986).

Subsequent to re-evaluation of the Resource Recovery Study, a search for and investigation of potential landfill locations was conducted by a Solid Waste Study Committee (SWSC), composed of individuals appointed by the Helena City Commission and the Lewis & Clark County Board of County Commissioners. The committee examined several possible sites within Lewis & Clark County and performed site-specific screening to determine the most appropriate location for a solid waste landfill. Public meetings were held to update the community on the process. Phase I of the siting studies identified eight potential locations for the landfill and recommended that five of those eight should be further evaluated (Damschen & Associates 1987). A Phase II siting study was completed in 1990 which evaluated four of the five sites (one site was withdrawn from consideration because it was not available for sale) using various economic, social, and environmental suitability criteria (Damschen & Associates 1990b). On July 24, 1989, the SWSC recommended that the "...governing bodies should proceed with the selection, acquisition, and licensing of a (landfill) site as soon as practical." The Committee suggested that the sites most suitable were Site E (first priority) and Site A (second priority) (Rasmussen and Macefield 1989). The County applied to the State of Montana DHES for a license for an 189 acre landfill at Site E in 1990. The DHES required that additional information be submitted for the application for license to be reviewed and to be sufficiently complete for environmental assessment. The Proponent upon notification of the necessary research required for the hydrogeologic characterization of the entire 189 acre site applied for, decided to reduce the proposed landfill area applied for to 80 acres, phase I of the original proposal. This change in the application made in August, 1990, was communicated to the DHES in meetings between the Proponent, the consultants, and the DHES. Subsequent review of the application, the Environmental Assessment and the DEIS have assessed the impacts of licensing 80 acres at Site E as applied for by the Proponent.

1.2 PURPOSE AND NEED FOR ACTION

Both the Helena Landfill and the County's Scratch Gravel District Landfill have almost reached their capacity for waste disposal. Environmental problems associated with each facility provide further stimulus to both Helena and Lewis & Clark County to find, license, and open a new facility which is protective of human health and the environment or to contract with an existing facility which has the capacity to offer a long-term disposal solution. Public need and demand for appropriate, environmentally safe waste disposal services will not abate.

After further review and modification of the landfill application, DHES held a public scoping meeting concerning the proposed facility on January 3, 1991 to solicit areas of concern to be addressed by the licensing review from the interested general public. An Environmental Assessment (EA) was prepared by DHES for the County's landfill license application in September, 1991. The purpose of the EA was to inform all interested governmental agencies, public groups, or individuals of the action proposed by the County to place a landfill at Site E, and to evaluate the overall impact of the proposed landfill on the human environment, in accordance with the Montana Environmental Policy Act (MEPA), and DHES rules implementing MEPA (Montana DHES 1991). A public hearing was held on the matter on October 23, 1991, and public comment was solicited for approximately forty-five days following issuance of the EA. On November 14, 1991, DHES notified the Lewis & Clark County Commissioners that an environmental impact statement would be necessary "...to fully explore the potential impacts this proposed landfill may have and to fully meet the letter and spirit of the Montana Environmental Policy Act" (Iverson 1991).

This EIS will present the DHES' analysis of environmental impacts under authority of the Montana Environmental Policy Act (MEPA) and associated rules and guidelines. The DHES will use the analysis in this EIS to make final permitting decisions concerning the County's landfill license application. Authority and responsibilities of DHES and other concerned regulatory agencies are described more fully in the following sections.

1.3 DEVELOPMENT OF THE EIS

The MEPA stipulates that a detailed statement regarding environmental impacts, alternatives, and other requirements be prepared for proposals for projects or major actions which significantly affect the quality of the human environment (§75-1-201(1)(b)(iii), MCA). DHES rules implementing MEPA at ARM 16.2.601 *et seq*. require the "detailed statement" referenced in MEPA to be in the form of an EIS. During the public hearing and comment period on environmental assessment of the County's application for a Site E license, DHES became aware of certain concerns regarding potentially significant impacts to the quality of the human environment. These issues included disposal of hazardous wastes at the site, impacts on recreational activities, and impacts to migratory and other bird species. The documentation of potentially significant impacts triggered the need for an EIS.

The steps in development of the EIS can be summarized as follows:

- The public and concerned regulatory agencies are afforded the opportunity to identify issues and concerns about the proposed action by participating in scoping meeting(s) and by submitting written comments. Concerns raised during the scoping process are then addressed in the EIS (Appendix A).

- Alternatives to the proposed action are developed which may reduce the potential for certain environmental impacts. The proposed action and alternatives to the proposed action are summarized in the draft EIS (Chapter 2.0).

- Environmental resources which may be affected by the proposed action or alternatives to the proposed action are described in the draft EIS (Chapter 3.0).
- An analysis of the potential environmental impacts caused by the proposed action and each of the alternatives is developed and described in the draft EIS (Chapter 4.0).
- The draft EIS is published for public review and comment. One or more public meetings are held to present the results of the draft EIS and solicit community input. Substantive comments are addressed in the final EIS.
- A final EIS is prepared and published, and used by DHES in making a decision on the proposed action or alternatives. The DHES decision will be documented either as a public notice of adoption of a decision included in the final EIS, or as a separate written record of decision (ARM 16.2.641(2)).

1.4 REGULATORY AUTHORITY AND RESPONSIBILITIES

The DHES is the lead agency responsible for preparation of this EIS. Interdisciplinary technical expertise was provided by a third party consultant under the direction of DHES. DHES will consider the proposed action and alternatives presented in this EIS, and issue a decision on the licenses and/or approvals required to proceed with siting, construction, and operation of a Class II landfill in Lewis & Clark County. DHES may approve the application as submitted or with stipulations, or deny approval, or approve a modification of the proposed action or an alternative action.

Other agencies have regulatory jurisdiction or expertise regarding issues pertinent to the landfill siting evaluations and decision. DHES has the responsibility to consult with and obtain the comments of any state agency which has jurisdiction by law or special expertise with respect to potential environmental impacts (§75-1-201(1)(c), MCA)). The following sections provide a brief description of the regulatory authority and responsibility of federal, state, and/or local governmental agencies that may require permits, issue approval, or provide expertise for the landfill project.

1.4.1 Department of Health and Environmental Sciences

1.4.1.1 Solid Waste Management Program - Lead Agency

The Solid Waste Management Program is part of the Solid & Hazardous Waste Bureau within DHES. The Solid Waste Management Program administers the Montana Solid Waste Management Act (§75-10-101 *et seq*. and §75-10-201 *et seq*., MCA) and administrative rules regulating solid waste disposal. The Montana Solid Waste Management Act includes policy regarding solid waste management in Montana and assigns administrative responsibilities at the state and local governmental levels. The Act specifies that, with few exclusions, "...no person may dispose of solid waste or operate a solid waste management system without a license from the department (DHES)" (§75-10-221(1), MCA). In addition, the Act allows for DHES denial of a license application after a finding that a solid waste management system cannot be operated in compliance with the Act, or a rule or order issued pursuant to the Act. The Solid Waste Management Program has primary authority within DHES to issue or deny landfill license applications, and is the lead agency for preparation of this EIS.

1.4.1.2 Water Quality Bureau

The Water Quality Bureau of the DHES administers the Montana Water Quality Act. This law provides a framework for the classification and protection of surface and groundwater uses. It also establishes surface water quality standards as well as permit programs to control the discharge of pollutants into state waters. Plans and specifications for any actions which could impact state waters must be submitted to the Water Quality Bureau for approval.

A Montana Pollutant Discharge Elimination System (MPDES) permit must be obtained before any discharge to surface water can occur. This permit contains water quality limitations and requires self-monitoring by the permittee, with verification by the Water Quality Bureau. If discharges are anticipated from a holding facility or retention pond, the County must obtain an MPDES permit. In addition, a Stormwater General Permit for Construction Activities must be obtained which describes the measures taken by the landfill to prevent stormwater runoff from the facility. A new permit must be obtained every five years.

1.4.1.3 Air Quality Bureau

The Air Quality Bureau within DHES administers rules and regulations for protection of Montana's air resources. Solid waste management facilities, particularly landfills, seldom require permits stipulating air emission allowances because the level of particulate matter released and organic vapor emitted from landfills in Montana is relatively small. However, the Air Quality Bureau was consulted because estimates of airborne particulate matter during construction/operation activities, and methane generation after cell closure, are included in the EIS.

1.4.2 Department of State Lands

Lewis & Clark County has applied to the Department of State Lands (DSL) for an open-cut mining permit. The permit would allow the County to excavate approximately 40,000 cubic yards (cy) of low permeability soils (clay) from Site E. According to the permit application, about 2 feet of topsoil would be removed from an approximate 5.4-acre area. Approximately 10 feet of clay across this area would be excavated and used as cap material for closure at the Scratch Gravel and City of Helena landfills.

The DSL's Reclamation Bureau has the responsibility to approve and administer permits issued under the Open Cut Mining Act. The Reclamation Bureau prepared an environmental assessment as part of the permit review and decision process. DSL subsequently granted the County approval to mine the material at Site E (Montana DSL 1992). The action proposed by the County and approved by DSL is considered a related and reasonably foreseeable development activity for Site E. As such, it will be evaluated in this EIS for cumulative effects with the Proposed Action.

1.4.3 State Historic Preservation Office

Under the Montana Antiquities Act, the State Historic Preservation Office (SHPO) has the responsibility to cooperate with DHES and advise them when potentially valuable historical, archaeological, or other cultural resources are located in the project area. Part of the advice given may include comments on a proposed action for impact mitigation of sites eligible for nomination to the National Register of Historic Places. The SHPO also reviews the EIS to ensure compliance with cultural resources regulations.

1.4.4 Department of Fish, Wildlife & Parks

The Montana Department of Fish, Wildlife & Parks (DFWP) has jurisdiction over many of the recreational lands and resources in the State, including some near possible landfill sites. In addition, the Department is responsible for programs associated with fish and wildlife protection and habitat preservation and enhancement. The Montana DFWP provided consultation during development of this EIS regarding resources potentially under their purview, particularly the description of wildlife and vegetative resources in Chapter 3.0, and the assessment of potential impacts to those resources in Chapter 4.0.

1.4.5 U.S. Fish & Wildlife Service

The U.S. Fish & Wildlife Service (USFWS) administers the Endangered Species Act and the Bald Eagle Protection Act. The USFWS has been notified of the proposed landfill siting activities during project scoping activities. The USFWS may review the EIS to ensure compliance with applicable federal regulations, particularly the two acts cited above.

1.4.6 Federal Aviation Administration

The Federal Aviation Administration (FAA) regulates air traffic activities, including that occurring at the Helena Airport. Subpart B of 40 CFR Part 258 contains numerous siting criteria for new solid waste landfills, including restrictions on placement of a new facility near an airport. The concern is that landfills can attract scavenger bird species which present a hazard to low-flying aircraft. Because a portion of one of the alternative landfill sites (Site A) considered in this EIS may be within 10,000 feet of an active runway of the Helena Airport, the FAA has been requested to review and provide comment concerning landfill siting or operations (Wilbur 1993a).

1.5 STUDY AREA

The study area for the Proposed Action is represented geographically by the Helena Valley. The borders of the study area are roughly drawn as the Missouri River and Belt Mountains to the east, the Boulder Batholith and Elkhorn Mountains to the south, the Continental Divide to the west, and the hills north of Helena. This area is both convenient and logical, since many of the resources evaluated in the EIS are also bound by geography; e.g., surface waters and ground water, air quality, vegetation, soils and to a lesser extent wildlife. The burden of funding the construction and operation of a new landfill would fall on businesses and residents in this area, as the Helena Valley also roughly delimits the Scratch Gravel

Landfill District. However, political boundaries are also important to this EIS. One of the alternative sites, the City-County Sanitation Service (CCSS) Landfill, is located just south of Lewis & Clark County in Jefferson County. Privately owned and operated facilities in Great Falls and Missoula are well outside the resource study area yet some consideration, in the form of liability evaluation and cost estimation, has been given to transporting wastes to one of these locations. Nevertheless, for the purpose of defining the limits of analysis on the environment most likely to be impacted by development of a new landfill, the study area is generally defined as above. The study area only varies according to the requirements of each environmental resource evaluated, as stated in Chapter 3.0.

1.6 ISSUES AND CONCERNS

A public scoping meeting was held on June 11, 1992 in Helena, Montana, to identify significant issues and concerns related to the proposed action. Comments, suggestions, and concerns about the project and associated EIS were gathered. In addition to the comments received at the public meeting, written comments were also received during the scoping process. A transcript of the public meeting is on file and available for public review at the Solid Waste Management Program's offices at 836 Front Street, Helena, Montana. Appendix A lists issues and concerns raised during the public meeting and other public forums which took place during the past few years regarding the County's landfill project. A brief summary of these issues and concerns is presented in Table 1.6-1. The issues and concern expressed by the public during scoping were considered in the development of alternatives and addressed in the analysis of impacts for the EIS.

Another scoping meeting regarding the proposed action was held on June 22, 1992, in Helena. The purpose of this meeting was to solicit comment and concerns from various resource agencies. DHES requested that agencies interested in providing input to the EIS send a representative to the meeting. The following agencies or interested groups attended or were invited to attend:

• State Agencies	Air Quality Bureau Water Quality Bureau Department of Fish, Wildlife, & Parks State Historic Preservation Office Montana Bureau of Mines and Geology
• Federal Agencies	U.S. Fish & Wildlife Service U.S. Environmental Protection Agency U.S. Geological Survey Bureau of Reclamation Soil Conservation Service
• Local Agencies or Groups	Lewis & Clark County Citizens for a Responsible Landfill Jefferson County Montana Environmental Information Center

The DEIS was published and distributed to the public and other public agency on April 22, 1993. A public hearing for comments on the DEIS was held May 17, 1993 and written comments were accepted until June 4, 1993. Testimony at the public hearing was provided by 17 individuals and 19 separate written comments were received by DHES. Copies of the written comments received and a transcript of the hearing testimony is included in Section 6.5.1. DHES' responses to comments on the DEIS are included in Section 6.5.2 of this document.

TABLE 1.6-1

ISSUES AND CONCERNS

RESOURCE AREA	SUMMARY OF ISSUES & CONCERNS
Soils & Geology	Types and depths of soils present at the sites; moisture-holding capacity of the soils; unsuitability of subsurface materials to prevent moisture infiltration; presence of radioactive soils; seismic instability of the Helena Valley; local fault zones.
Ground water	Impact of a landfill on local springs and private water wells; ground water contamination; liner puncture; limited water supplies; subsurface permeability; inadequacy of ground water investigations; depth to ground water; lack of aquifer tests; requirements for ground water monitoring; impacts to irrigation systems.
Surface Water	Hydrologic connection of landfill site to local surface waters and Missouri River; surface water runon and runoff; impacts to water resources of Helena Valley, Hauser Lake.
Air Quality & Odor	Control of dust and litter; impacts on downwind residents and communities; lack of site-specific information; impacts to air quality from paving or road maintenance materials; open burning.
Noise	Impacts of truck noise on Warren School; need for mitigation measures; effect of increased noise on residents along the transport routes.
Wildlife	Loss of wildlife habitat; impacts to wildlife; displacement of animals; lack of "expert" agency consultation; impacts to migratory birds; impacts on bald eagles; increased bird scavenging.
Vegetation	Weed control during operation and after landfill closure; vegetative cover requirements; adequacy of revegetation plan.
Land Use & Recreation	Final use of the landfill (after closure); proximity to residential areas; other potential development areas; impacts to agricultural operations; impacts on adjacent land uses and value; use of uncontaminated property; potential hazards to recreationists; impact to nearby golf course; impacts to tourism.
Roads & Transportation	Cost of road maintenance; safety of children using transport route; ability to maintain road during winter storms; site access; proposed road routes; road conditions and need for road improvements; straightening of the curve at Warren School; traffic volumes; limitations on public access to landfill; cost of road improvements; mitigation measures; development of alternate routes in the event of floods; steep road grade leading to Site E; hauling distance for private citizens.

Table 1.6-1 (Cont'd)

ISSUES AND CONCERNS

RESOURCE AREA	SUMMARY OF ISSUES & CONCERNS
Landfill Engineering	Presence and handling of hazardous materials; use and adequacy of liners and leachate collection systems; post-closure landfill use; cover requirements; contingency plans for equipment failure; quantity and quality of leachate; holding pond capacity and location; controls on waste input; ability to screen for toxic chemicals; adequacy of fire control measures (if developed); fencing and other safety measures; methane gas generation and control.
Cultural Resources	Old cabin at Site E; long-term (multi-generational) users and owners of nearby properties.
Visual Resources	Visual appearance of landfill; visibility of landfill from nearby roads and interstate; roadside litter; disregard for visual impacts on surrounding landowners and land users.
Montana Environmental Policy Act	Comprehensive EIS is required by law; comparison of cost of an EIS vs. cost of Superfund (cleanup); objectivity of studies; impacts of alternatives must be thoroughly addressed;need to address other related activities and cumulative effects.
Socioeconomics	Cost of landfill and impacts to ratepayers; cost of law enforcement; encroachment into Jefferson County; tax incentives to Jefferson County; depreciation of property values; conflict of landfill development with City-County Planning Board's long range plan; cost of road maintenance; economic impacts to other land uses (agriculture, ranching, etc.); financial assurance for corrective action; cost of regulatory compliance; cost of EIS vs. Superfund; loss of revenue due to decreased development; purchase of site E prior to license approval; overall impacts to economic development; lack of accountability when publicly owned; high transport costs; need for landowner compensation; fire protection; economic consequences of harm to human life; liability costs, pollution insurance.

Table 1.6-1 (Cont'd)

ISSUES AND CONCERNS

RESOURCE AREA	SUMMARY OF ISSUES AND CONCERNS
Alternatives	Should consider the following: Alternative energy sources; condemned land east of smelter; land purchase vs. lease; recycling, specific recycling machine; incineration; other locations; public vs. private land; rail access; prohibition on accepting out-of-state garbage; questions about site selection and recommendation process; objectivity of consultants; impacts of alternatives; public policy; development of reasonable and responsible alternatives; privatization; local containers for waste "drop off;" must evaluate no-action alternative; must identify preferred alternative; incorporate mitigation measures; regional approach needed to solid waste management.

2.0

PROPOSED ACTION, ALTERNATIVES, AND OTHER DEVELOPMENT ACTIVITIES

2.0
PROPOSED ACTION, ALTERNATIVES, AND OTHER DEVELOPMENT ACTIVITIES

This chapter of the FEIS summarizes the proposed Lewis & Clark landfill project. Alternatives to the proposed action, including a No Action alternative, are also summarized. The chapter presents a description of: (1) How alternatives to the Proposed Action were developed, (2) the Proposed Action at Site E, (3) the siting alternative at Site A, (4) the siting alternative at the CCSS Landfill, (5) a modification employing recycling and composting technologies in addition to landfilling, and (6) the No Action alternative. Related development activities, such as the City-owned transfer station, DSL mining permit, and proposed or actual road improvements are discussed near the end of the chapter. The DHES' preferred alternative is presented at the close of the chapter.

2.1 DEVELOPMENT OF ALTERNATIVES

As discussed in Chapter 1.0, there are two municipally owned and operated Class II landfills in southern Lewis & Clark County which accommodate the sanitary or non-hazardous components of the waste stream generated in this area. These two facilities are the Scratch Gravel landfill and the City of Helena landfill. As Class II disposal sites, they may accept Group II (organic and mixed solid) and Group III (wood and insoluble, inert solid) wastes. There is also a Class III disposal site, known as the East Helena Class III landfill, which may accept only Group III wastes. Another Class II facility, the City-County Sanitation Service (CCSS) landfill, is located about 1-1/2 miles south of East Helena in Jefferson County. This facility, also known as the "Tenneson" landfill, is privately owned and operated. Locations of these facilities are shown on Figure 1.1-1.

The Site E landfill Proponent (Lewis & Clark County) has estimated that the 35,000 residents of Lewis & Clark County (including City of Helena) which a new facility would service would generate about 40,000 tons per year (TPY) of Class II (both Group II and Group III) wastes (Damschen & Associates 1990a & 1990b). However, the service area and subsequent waste volume may require adjustments that alter the capacity of a new landfill, for the following reasons:

1. In 1990, East Helena sent its Class II wastes to the CCSS landfill. However, East Helena waste would be included in the service area for the new Lewis & Clark landfill (Murgel 1992). It is reasonable to assume that East Helena would contract to use the new facility as well, although this possibility is by no means certain.

2. A 1990 census indicated a combined population of about 43,500 for unincorporated Lewis & Clark County and Helena, with a projection of approximately 49,600 for the year 2000 (Robert Peccia & Associates 1992).

3. Waste diversion from the landfill may increase as recycling processes receive increasing public support and involvement.

In 1986, annual solid waste disposal estimates included 30,000 tons at the City of Helena landfill (over 1,400 TPY of this amount were generated in East Helena, Fort Harrison, private contractors,and individuals outside the city limits). An additional 10,000 TPY was disposed at the Scratch Gravel landfill. The remaining Group III wastes deposited at the East Helena Class III site were estimated to represent only a few hundred tons per year. Waste is currently transported to the Helena and Scratch Gravel landfills jointly by packer trucks and individual residents.

Both the Helena and Scratch Gravel landfills were expected to reach capacity by 1989 to 1990. Modifications to licenses and in waste disposal practices have somewhat extended the life of each facility, but neither has much, if any, remaining capacity. In addition, both facilities have likely contributed to ground water contamination plumes which have extended beyond their license boundaries.

2.1.1 Proposed Solid Waste Management Facility

The Proposed Action, which consists of developing and operating the first phase of a landfill at Site E, is planned as a replacement for both of the municipal Class II landfills. Although plans for the facility have been modified since the first license application was submitted to DHES, the current designs include engineering controls to protect environmental resources. The Proposed Action is projected to provide a solid waste disposal facility for the residents of Helena, East Helena, and the Scratch Gravel Landfill District, for approximately 50 years. The facility would be owned by Lewis & Clark County and operated by the Scratch Gravel Landfill District, an administrative subunit of the county. The District would continue to provide management of solid waste for the southern portion of Lewis & Clark County, and incur the debt necessary to construct, operate, and eventually close the landfill. A transfer station, for future use in conjunction with the Proposed Action or other disposal Alternatives, has been sited, designed, and licensed for operation by the City of Helena at the existing Helena Landfill. The transfer station is discussed in Section 2.7.1.

2.1.2 Regulatory Framework

Siting efforts for a new Lewis & Clark County landfill began in 1987 with publication of a study, sponsored by the Scratch Gravel District, which considered and screened a number of possible locations for a new solid waste facility (Damschen & Associates 1987). An application for licensure and operation of the proposed Site E facility was submitted to DHES in 1990 in accordance with existing state solid waste regulations (ARM Title 16, Chapter 14, Subchapters 4, 5, and 7). Since that time, federal regulations pertinent to the Proposed Action (40 CFR Part 258) have been promulgated and became effective October 9, 1993 for new landfills. Also revisions to state rules governing solid waste management in order for Montana DHES to gain program approval and primacy regarding solid waste issues within the state, were formally adopted in June, 1993 and they too were effective October 9, 1993. The preliminary design, and/or operational parameters in the original application for the Proposed Action were not consistent with the now current solid waste rules. The Proponent has submitted alternative liner design for the initial disposal areas that is in compliance with current State and Federal rules and operational parameters will be required to be consistent with the rules as a condition of a license being issued by DHES.

2.1.2.1 National and Montana Environmental Policy Acts

The National Environmental Policy Act (NEPA), enacted in 1970, established the process by which environmental analysis of major actions or activities with potential environmental impacts are evaluated. NEPA requires full disclosure of federal actions significantly affecting the quality of the human environment. The processes most commonly used for the disclosure of "effects" are the environmental assessment (EA), or the more comprehensive environmental impact statement (EIS). Montana followed suit with its Environmental Policy Act (MEPA; §75-1-101 *et seq.*, MCA) in 1971 and established such laws and regulations for major state actions with potential environmental impacts.

MEPA requires the use of a systematic and interdisciplinary approach to assure the integrated use of the natural and social sciences, and the environmental design arts. In addition, MEPA requires the identification/development of methods and procedures which will assure environmental amenities and values are given appropriate consideration with economic and technical considerations. A detailed statement concerning potential environmental impact, adverse environmental effects, action alternatives, evaluation of short- and long-term impacts, and projected commitments of irreversible or irretrievable resources must be included in every recommendation or report. DHES rules implementing MEPA (ARM 16.2.601 *et seq.*) provide further explanation of the statute's intent. Included in the rules are definitions; determination of necessity for EIS development; preliminary environmental reviews; preparation, content, and distribution of the EIS; special rules particular to certain MEPA situations; fees assessed for EIS preparation; and preparation, content, and distribution of a programmatic review.

2.1.2.2 40 CFR Part 257 and 258

New and existing landfills must comply with pertinent subparts of regulations at 40 CFR Part 257 and 258 and amendments (FR 57/124 June 26, 1992), which implement Subtitle D of the Resource Conservation and Recovery Act, if they intend to receive waste after the effective date of October 9, 1993 (April 9, 1994 for existing landfills that received less than 100 ton per day). In this context, "new" is defined as a new or laterally expanded landfill that actually receives waste after October 9, 1993. An "existing" landfill refers to a facility in operation prior to that date. The Proposed Action would be covered by all provisions of these rules when beginning operation.

Table 2.1-1 contains a summary of specific solid waste management requirements in Subtitle D. These regulations address several aspects of municipal solid waste landfilling including:

- Location restrictions with respect to floodplains, airports, wetlands, seismic zones, fault areas, and unstable areas (Subpart B)

- Operations plan including control of hazardous waste, polychlorinated biphenyls (PCBs), and liquid disposal; daily cover application; nuisances; explosive gases; open burning; access; runon/runoff; and surface water (Subpart C)

TABLE 2.1-1

SUMMARY AND COMPARISON OF SOLID WASTE REGULATIONS

Criteria	Montana 16.14.500 & 16.14.700	40 CFR Parts 257 & 258
1. Siting	A. Fatal Flaw: In 100-yr floodplain or wetlands B. Fatal Flaw for New Landfills w/o Demonstration: Proximity to fault areas, seismic impact zones C. Fatal Flaw for All Landfills w/o Demonstration: In proximity to airport, and unstable areas C. FAA notification for new landfills located within 5 miles of an airport	A. Fatal Flaw for New Landfills w/o Demonstration: Proximity to wetlands, fault areas, seismic impact zones B. Fatal Flaw for All Landfills w/o Demonstration: In proximity to airport, 100-year floodplain, and unstable areas C. FAA notification for new landfills located within 5 miles of an airport
2. Operating	A. Operations and Maintenance Plan • operating hours • equipment • system operation • maintenance schedule • wastes accepted & treatment • prevent disposal of hazardous wastes & PCBs • litter & vector control • control open burning, litter, vectors, & scavenging • Control explosive gases & methane monitoring • access control • Control surface water runon/runoff & discharge • Prevent disposal of liquids • Recordkeeping B. Compact waste apply 6 inches daily cover	A. Prevent disposal of hazardous wastes & PCBs B. Apply daily cover C. Control vectors D. Control explosive gases E. Control air pollution & open burning F. Control access G. Control surface water runon/runoff H. Control surface water discharge I. Prevent disposal of liquids J. Recordkeeping

TABLE 2.1-1 (Cont'd)

	Criteria	Montana 16.14.500 & 16.14.700	40 CFR Parts 257 & 258
3.	Design (Class II Landfill)	A. New Landfills or lateral expansions of existing landfills • Establish POC within 150 meters of unit boundary • Design approved by DHES that prevents exceedence of MCL's in uppermost aquifer (requires demonstration) or • Composite liner and leachate collection system • Verfication of construction of design features by DHES approved contruction quality control & assurance plans	A. New Landfills in Unapproved State: • Establish POC at boundary • Composite liner and leachate collection system B. New Landfills in Approved State: • Establish POC within 150 meters of boundary • Ensure compliance w/MCLs
4.	Groundwater Monitoring	A. Hydrogeologic & soils report B. Detection monitoring • location & number of monitoring wells • Well construction • Sampling and analysis plan • Reporting and planning C. Assessment monitoring F. Corrective action	A. Establish monitoring program (If releases or contaminant detections, establish detection monitoring, assessment monitoring, and possibly initiate corrective action
5.	Closure & Post-Closure	A. Prepare closure and post-closure plans B. Final cover w/infiltration and erosion layers, revegetation C. Deed notification & landuse restrictions D. Post-closure care for 30 years • Ground water & methane monitoring	A. Prepare closure and post-closure plans B. Final cover w/infiltration and erosion layers, revegetation C. Deed notification & landuse restrictions D. Post-closure care for 30 years • Ground water & methane monitoring

TABLE 2.1-1 (Cont'd)

Criteria	Montana 16.14.500 & 16.14.700	40 CFR Parts 257 & 258
6. Financial Assurance	A. For all existing & new landfills effective April 9, 1995 B. For closure and post-closure care C. For corrective action	A. For all existing & new landfills effective April 9, 1995 B. For closure and post-closure care C. For corrective action

- Design criteria (Subpart D) requiring
    - Minimum two-foot compacted clay liner with maximum permeability of 1×10^{-7} cm/sec, overlain by a minimum 30-mil flexible membrane liner and leachate collection system or

      or

    - Demonstration that the concentration of 24 priority compounds will not exceed the Maximum Contaminant Level, as established in the Safe Drinking Water Act, at the point of compliance for an alternative liner design approved by a State agency in an approved State
- Performance ground water quality standards (Subpart E) requiring that drinking water standards are not exceeded at a point of compliance (up to 150 meters from the boundary of the landfill). The ground water monitoring requirements include
    - Sufficient number of appropriately located wells which yield samples representative of background water quality, and the quality of water passing the point of compliance.
    - Background water quality must be established and sampled at least semi-annually through closure and post-closure of the facility for a standard set of indicator compounds.
    - If ground water contamination occurs, the landfill owner must make an assessment of possible corrective measures and take corrective action.
- Closure and post-closure (Subpart F) requiring
    - Closure and post-closure plan
    - Final cover with composite barrier and erosion layers
    - Post-closure care for 30 years
- Financial responsibility for closure, post-closure, and corrective actions (Subpart G)

New landfills or lateral expansions of existing facilities must comply with Subtitle D when they become operational, with the exception of the financial assurance requirements, which must be met by April 1995. Existing facilities must achieve compliance within a phased schedule that extends to 1996.

All of the federal requirements will apply to the proposed Lewis & Clark County landfill since the effective date of for new landfills of October 9, 1993 has passed. The one exception is the requirement for financial assurance for closure and post closure care which will not be come effective until April 9, 1995.

The impact of these regulations on Lewis and Clark County's existing landfills will include those demonstrations and operational and construction changes needed to come into compliance with Subparts B, C, and E through G. In addition, if continued use of these facilities results in a lateral expansion, the design criteria (Subpart D) must also be satisfied. Alternatively, if these landfills are closed prior to the effective date (effective date for these landfills is April 9, 1994), only the closure requirements of Subpart F must be met.

In Montana the federal rules have been implemented with the adoption of revised State administrative rules in July 1993, and is enforced through a state program, which meets or exceeds technical requirements of 40 CFR Part 258. While providing the same degree of environmental protection as Subtitle D, the state program may allow greater flexibility to landfill owners and operators as local conditions (such as climate, subsurface soils and geology, and depth to ground water) may provide some measure of natural protection. Montana-specific flexibility primarily is focused on liner and final cover requirements that allow alternatives to the composite systems described by Subtitle D (and amendments).

The state program is in place and Montana's program has received approval from EPA. The EPA's Final Determination of Adequacy for Montana's Solid Waste Management Program was published in the Federal Register on December 21, 1993.

2.1.2.3 Montana Solid Waste Statutes and Regulations

Montana Solid Waste Act (Title 75, Chapter 10, Parts 1 and 2, MCA) - Enacted in 1977, and further amended in 1991, this statute established policies for source separation, maximum recycling, development of solid waste management systems, privatization, local government control, and state assistance. Amendments to the Act established six solid waste disposal regions (both Lewis & Clark and Jefferson counties are located in the southwestern Montana region). It charged DHES with:

- Developing solid waste management rules necessary to implement the policies of the Act
- Providing organization, technical, and financial assistance to local governments
- Serving as a clearinghouse for solid waste information

The Act also provides direction regarding solid waste management issues such as variances from compliance with DHES rules, ground water monitoring, disposal of solid waste in unauthorized areas, disposition of dead animals, and other technical requirements. The Act also outlines procedures for license submissions and other administrative requirements, including administrative enforcement, license denial or revocation, and penalties.

Montana Integrated Waste Management Act (§75-10-801 *et seq.*, MCA) - Enacted in 1991, this statute identified a state recycling goal to reduce the volume of solid waste landfilled or incinerated by at least 25 percent between 1991 and 1996. It established policies prioritizing integrated solid waste management, based upon a hierarchy which emphasizes source reduction and recycling over landfilling and incineration.

This Act required DHES to develop a state solid waste management and resource recovery plan incorporating 40 CFR Part 258.

Ground Water Monitoring Rules (ARM §16.14.701 *et seq.*) - The ground water monitoring rules offer a consistent approach to the establishment and operation of a water quality monitoring system. For instance, the rules establish criteria for determining how many monitoring wells to install and how deep wells should be drilled and screened. Minimum criteria are set forth, but the rules do provide flexibility based on landfill design and construction specifications, and local geologic conditions. The rules also provide for assessment monitoring programs and requirements for corrective action.

Montana Refuse Disposal Regulations (ARM §16.14.501 *et seq.*) - These regulations were amended in 1993 and provide standards for the transport and management of solid wastes. Specific standards address:

- License application
- Site location, design, and access
- Soil and hydrogeological characteristics
- Operation and maintenance planning, monitoring, closure and post closure care
- Miscellaneous issues including variances, licensure, inspection, and enforcement

The refuse disposal rules identified two waste groups based on physical and chemical characteristics; Group II (organic and mixed solid) and Group III (wood and insoluble, inert solid wastes).

2.1.3 Licensing Process

In 1985, it became evident to Lewis & Clark County Commissioners and the Scratch Gravel Landfill District that existing landfill capacity would be reached within five years. Through a joint resolution of the City of Helena Commission and the Lewis & Clark County Commissioners, a Solid Waste Study Committee (SWSC) was formed to identify and evaluate long-term solid waste management alternatives for the City of Helena and southern Lewis & Clark County.

Initially, SWSC evaluated a 1981 Resource Recovery Study prepared for the City of Helena. During this evaluation, the County asked ASARCO representatives to consider constructing a waste-to-energy (WTE) facility at the East Helena smelter. ASARCO responded that such a facility was not feasible due to economic, environmental, and social considerations. SWSC subsequently concluded that this option was not feasible for Lewis & Clark County (Damschen & Associates 1987). SWSC then contracted with the engineering firm Damschen and Associates to site a Class II solid waste landfill. The siting study was completed in two phases. The methodology, findings, and conclusions are documented in the Phase I and Phase II Reports (Damschen & Associates 1987 and 1990b, respectively). A brief summary is provided below.

2.1.3.1 Phase I Study

Phase I of the siting study was initiated in February 1987, with a meeting to present the public with the study's objectives and approach. Mandatory siting requirements and characteristics considered "fatal flaws" were identified at the beginning. Siting criteria specifically addressed proximity to floodplains, depth to ground water, proximity to wetlands and public water supply watersheds, depths to bedrock, proximity to airports, and land use conditions. The criteria were used to screen the study area, which extended from Winston to the southeast, the Missouri River to the northeast, the Helena National Forest to the west, and Clancy and the Helena National Forest to the south. Some portions of the County which did not meet one or more of the criteria were eliminated immediately. A windshield survey of remaining County lands was conducted using additional criteria including travel distance from Helena, proximity to major highways, proximity to major development and subdivisions, potential visual impacts, current land use, and hydrogeology. Sixteen potentially suitable candidate areas were identified. Further review led to the selection of eight candidate areas, Areas A through H. One of these, Area G, was just west of the existing Scratch Gravel Landfill.

The candidate areas were then rated by (1) weighing each criterion to represent its significance, and (2) ranking the suitability of each area with respect to that criterion. The result was a total rating score for each, summarized in Table 2.1-2. From this analysis, Area E appeared to have the greatest suitability for a sanitary landfill, while Area G had the least.

TABLE 2.1-2

PHASE I RATING RESULTS

AREA	RATING[1]
A	342
B	349
C	351
D	342
E	357
F	347
G	272
H	283

[1] The higher the score, the better the overall rating for a site. SOURCE: Damschen & Associates 1987

A public meeting was held on August 25, 1987 to obtain public input on eliminating three of the candidate sites. Verbal and written comments were received. Subsequently, Areas D, G, and H were eliminated from further consideration due to low rating scores and public opposition (Areas G and H), and potential traffic and visual impacts from increased traffic on Canyon Ferry Road and Hart Lane (Area D). Therefore, Areas A, B, C, E, and F were carried into Phase II for further investigation.

2.1.3.2 Phase II Study

Phase II began in January 1988. A site walkover to evaluate topographical, hydrogeological, transportation, aesthetic, and land use criteria was used in conjunction with existing soil and ground water information to delineate specific sites within each of the five candidate areas. A ranking analysis of Sites A, B, C, E, and F was then prepared based on economics, the environment, and "socio." The Phase II report includes a detailed description of each site (Damschen & Associates 1990b).

Following a public meeting, held on September 28, 1988, a final ranking system was developed to rate each site. Site A ranked highest, and Sites B and E ranked lowest. In January and February 1989, the owner of Site F decided not to sell his property, eliminating this site from further consideration. Adjacent landowners of Sites A and E changed their intentions of selling property to the County. This change caused a shift in the Site A and E boundaries and, according to the Phase II analysis, altered their apparent suitability for landfill activities by decreasing the usable area of Site A and increasing the size and suitability of Site E.

Hydrogeologic investigations, conducted during the spring of 1989, focused on the remaining sites A, B, C, and E. The results of the siting evaluations, taken from the Damschen & Associates Phase II study (1990b) including a report by Chen-Northern (1990a), are summarized below. A summary of descriptive site information is included in Table 2.1-3. The location of each of these sites is shown in Figure 2.1-1.

Environmental - Environmental criteria included depth to ground water, distance and location of adjacent wells, adjacent ground water use and permeability of soil materials. A field investigation was initiated in the spring of 1989 to augment previously assembled data which included ground water and water well data. The field work included backhoe test pits (all sites) and test borings (Sites B, C, and E). At the time it was determined that adequate well log and geologic mapping data was available for Site A. From the field investigation results, it was concluded that Sites A and E were substantially more favorable than Sites B and C due to the subsurface soil types and their low permeability, deeper depths to ground water, and more suitable on-site borrow material for daily cover. This analysis was focused on determining the most environmentally protective site, without the knowledge that forthcoming federal regulations would establish minimum design criteria for solid waste management facilities.

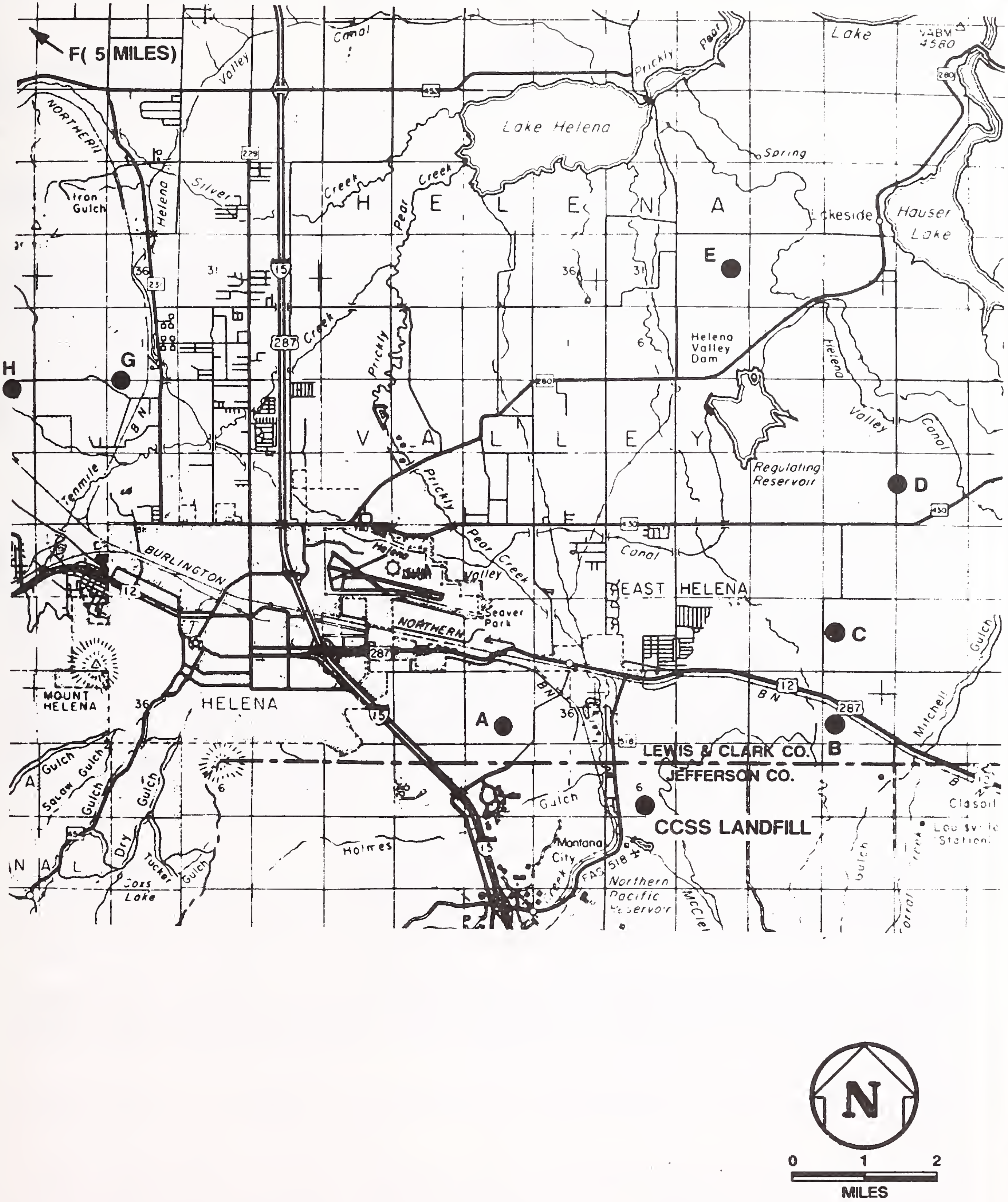
Sociological - Sociological criteria included visual impact, potential land use, and the transportation network needed to haul the wastes from Helena and the District to each site. Sites A and E appeared to have the least visual impacts, but higher potential for future land use than Sites B or C. It was estimated that Sites A and B would create the least adverse impacts due to transportation. The report recommended

TABLE 2.1-3

SUMMARY OF SITE DATA - PHASE II SITING STUDY

	Site			
Item	A	B	C	E
General Location	1.5 miles southwest of East Helena immediately east of power lines in Section 2 and 35.	3 miles east of East Helena immediately south of BN tracks in SW¼ of Section 34	3 miles east of East Helena & 1 mile north of U.S. 12 on Diehl Lane in NW¼ of Section 27	1.5 miles north of York Road & 1/2 mile east of Lake Helena Dr. in southern 1/2 of Section 32
Owner(s)	Miller	Diehl	Diehl	Greenfield, Plymale
Usable Acreage	80	125	110	189
Acre Usage/Year (40,000 TPY)	1.6	2.5	1.6	1.6 to 2+
Life of Site (Yrs)	50	50	69	112 to 91
Distance from Helena (Mi)	8.6	11.8	11.9	10.5
Distance from District (Mi)	11.7	14.9	13.8	11.7
Estimated Depth to Groundwater	100 ft	85 ft	85 ft	115 ft
Land Use	Mostly Crop	All Crop	All Crop	Mostly Crop
Access Rqmts.	3,500 LF of New Road	200 LF of New Road and New R.R. Crossing	5,000 LF of Improved Road	8,800 LF of Improved Road & 1,000 LF of New Road

SOURCE: Damschen & Associates 1990b



SOURCE: DAMSCHEN & ASSOCIATES 1987 AND 1990b

Job No. : 23050E
Prepared by : K.W.
Date : 3/23/93

CANDIDATE LANDFILL SITES, INCLUDING CCSS FACILITY

FIG. 2.1-1

that use of Site E as a landfill should include mitigation measures such as a transfer station to decrease the impacts of hauler traffic.

Economical - Economic criteria included capital costs, liner costs, annual operation and maintenance (O&M) costs, and the estimated transportation costs to haul the waste from Helena and other areas of Scratch Gravel Landfill District. Considering land purchase and site capacity, it was estimated that Site A would have the highest capital cost, primarily due to a purchase price estimated at the time to be three times greater than any of the other sites. Site B was believed to have the lowest purchase cost. However, when taking into consideration the capital expenditures required for each site in relation to the amount of land available for development as a landfill, Site E was estimated to have the lowest capital cost per acre.

It was determined that Sites B and C would require liner systems, thereby increasing their capital and development costs, while Sites A and E would not need liners (See Section 2.2.7 for a discussion regarding the validity of this assumption, in light of Subtitle D requirements passed after the siting study was prepared). The annual cost to operate and maintain each site was relatively comparable for all four, with the lowest cost for Site A and highest at Site E. Transportation costs, including a transfer station for City residents, were estimated to be highest for Site B and lowest for Site A. Sites A and E were determined to have the lowest overall system costs per year.
Final ratings developed for each site during the Phase II study are included in Table 2.1-4. Site A ranked highest when the ratings for the three categories are combined. Upon review of these results, Site E was selected by SWSC as the first priority site, apparently because of the lower purchase price for more acreage, relative to Site A (Rasmussen and Macefield 1989). Another public meeting was held on August 23, 1989 to discuss these results.

TABLE 2.1-4

PHASE II RATING RESULTS

	Site			
Item	A	B	C	E
Environment	3	1	2	4
Sociology	3	4	1.5	1.5
Economics	4	1	2	3
Total	10	6	5.5	8.5
Rank	1st	3rd	4th	2nd

NOTE: 4 Points = Best Site; 1 Point = Poorest Site

SOURCE: Damschen & Associates 1990b

Additional hydrogeologic investigations were undertaken to confirm the acceptability of Site E. Following an additional public meeting (September 1989), the City and County authorized final approval of Site E. In October 1989, Damschen & Associates began design efforts for Site E, which included further field work and preparation of the licensing application. The field work was completed during the winter of 1989/1990 and an operation plan and license application was submitted to the DHES Solid & Hazardous Waste Bureau in March 1990 (Chen-Northern 1990a and Damschen & Associates 1990a).

2.1.3.3 License Application

The original Class II Sanitary Landfill Operation Plan and License Application was submitted to DHES by the Scratch Gravel Landfill District Board on March 16, 1990 (Damschen & Associates 1990a). This document included application information, preliminary design drawings, summary of the site hydrogeology including soil and ground water conditions, and leachate migration potential. The proposed operating plan described the development of a proposed 189-acre landfill in three phases. It also included the following plans for operation. The original application and plans for design and operation of the proposed landfill have been significantly modified during the license review process. See Section 2.2 of this document for a up to date explanation of the proposed landfill design and plan of operation.

Ground Water Monitoring Plan - The plan described the existence of one upgradient and two downgradient (east of site) wells to monitor ground water quality in the Phase I operating area, and the commitment to install additional wells as on-going landfilling operations moved into Phases II and III (Chen-Northern 1990a 1990b). This plan was later expanded to include sampling frequency, standard operating procedures, and analytical parameters (Hazen 1990). These plans are described in Section 2.2.4. Additional monitoring wells were drilled around the 80-acre site during the license review process and a new ground water monitoring plan will be required for approval if licensed.

Transportation Plan - Two transportation options were evaluated: (1) direct haul by packer truck including access by 850 vehicles every day during summer months, and (2) consolidated haul from a central transfer station including 4 to 7 trailer trips per day. Helena and Scratch Gravel District officials proceeded with a transfer station analysis (refer to Section 2.7.1).

Landfill Plan - This plan described sequencing of the 180-acre landfill within the 320-acre site in three phases. General dimensions, source of soil materials, drainage control, life of the facility, and end use are discussed. Also see Section 2.2.1.

Operation Plan - The Operation Plan described general operating procedures, daily earthwork, and nuisance control (refer to Section 2.2.3).

DHES License Review Process - The District Board was notified by DHES that the application was incomplete by letter in April 1990. DHES cited missing landowner information, inadequate operation and maintenance plan, and hydrogeological data, as well as lack of specific ground water monitoring plan details. Discussions were held during the Summer, 1990 between the proponent, DHES staff, and the consultants for this project concerning what information was necessary to complete the application for this proposed 180-acre landfill. It was made clear that more technical data was necessary to comply with the required hydrogeological characterization of the proposed landfill site and the necessary monitoring network data needed for all phases of the proposed facility and that preliminary design plans for phase II and III would also be necessary.

The result of this requested additional work led the Proponent to reconsider the facility application and to decide to request that the application for the landfill be reduced to only the proposed 80-acre phase I area. This decision was made at a Scratch Gravel District Board meeting held August 23, 1990 that was attended by DHES staff and was communicated to their consultant in a letter dated August 27, 1990. This decision was discussed with DHES in subsequent meetings concerning the proposed landfill and from that point on the application was considered revised to request a license for only the 80-acre "phase I" landfill within the 320-acre Site E.

An on-going response to the notice of incompleteness was submitted to DHES in May and August 1990. DHES in this time frame informed the proponent and their consultants that based on the information presented characterizing the hydrogeologic setting that this facility would be required to be designed to have a liner and leachate collection system under existing rules at that time. The Phase II hydrogeological report (Chen-Northern 1990c) and design drawings for a two-foot compacted soil liner and leachate collection systems were submitted in November 1990.

A public meeting to explain and to receive comments concerning the revised application was held in January 1991 by the DHES. A second notice of incompleteness was issued by DHES in March 1991 (Wilbur 1991). Cited requirements included additional attention to sociological, operating, hydrogeological, design, and construction concerns. Follow-up responses submitted in April and August 1991 included noise survey data, a proposed covered load ordinance, soil testing results, liner and leachate system specifications, and a construction quality control and assurance plans.

2.1.3.4 Environmental Assessment

DHES prepared an EA for the proposed 80-acre Lewis & Clark County landfill (Site E) in September 1991 (Montana DHES 1991). The purpose of the EA was to ensure that the proposed landfill met the minimum requirements of the Montana Solid Waste Management Act and administrative rules regulating solid waste disposal. DHES found that the operation of the proposed facility would not significantly affect the quality of the human environment, and that potential impact to water resources would be mitigated by engineering controls. The EA stated that an EIS was not necessary, but recommended that input from the public be obtained. It was concluded that, unless additional environmental problems were identified, the landfill should be licensed as a Class II Solid Waste Management System.

The EA was released for public comment on September 23, 1991 and a public hearing was held October 23, 1991. The EA was met by significant opposition from the public and local government. DHES subsequently determined that an EIS would be necessary. DHES' consultant began preparation of the EIS in June 1992.

2.1.4 Scoping Process

The Montana DHES and Lewis & Clark County have been receiving feedback concerning the proposed landfill since the siting study was first initiated. Input has come from a wide variety of sources, but primarily from citizens in the vicinity of the alternative landfill sites and public interest groups. Comments regarding the studies and licensing processes were submitted primarily at public meetings held at critical stages in both the Phase I and Phase II siting studies, and both prior to and after completion of the EA. The primary issues of concern were similar to those identified in the EIS scoping meetings. (See Appendix A).

The purpose of the scoping meetings, as the first step in the EIS process, was to identify and determine the public and agency concerns related to the proposed Site E Landfill that required further consideration. The scoping process also was used to help develop alternatives to the proposed action and assure that appropriate agencies were informed of the purpose of the EIS. The EIS public scoping meeting was held June 11, 1992 in Helena, Montana. An overview of the EIS process, and a history of the siting and license application procedures were presented. Approximately 50 people attended. Comments and concerns were expressed by some persons at the meeting. Written comments were submitted at the meeting and for approximately 30 days after the meeting.

An agency scoping meeting was held on June 22, 1992. In addition to the Solid Waste Management personnel, the DHES Water Quality Bureau was the only invited agency represented. Persons representing Citizens for a Responsible Landfill, the Montana Environmental Information Center, and Jefferson County also attended.

Subsection 1.6 and Table 1.6-1 summarize the primary public issues and concerns identified through the EIS scoping process. Appendix A includes a comprehensive list of these items, as well as a cross-reference to the location within this text where they are specifically addressed, if applicable.

2.1.5 Preliminary Identification of Alternatives

In accordance with MEPA requirements, alternatives to the proposed landfill at Site E were identified for comparative evaluation with respect to environmental impact. Alternative selection was based on: (1) technology, with consideration of alternative waste management processes (including those which could have less environmental impact); (2) alternative sites, including those considered in the siting studies; and (3) issues which control both technology and siting alternative combinations, as presented by the public during the EIS scoping process.

The "universe" of alternatives does not and cannot include every known technology or disposal site. Considerable time was spent at the public and agency scoping meetings discussing the need to limit the number of sites considered. This was necessary to allow evaluation of reasonable options for achieving the same goal (i.e. manage the future solid waste stream) with minimal environmental impact via a process that could be completed in an efficient, economical manner while still being responsive to public concerns.

The following alternatives were preliminarily identified at the onset of the EIS process:

- Proposed Action (Site E)
- Alternative Landfill Sites
    - Sites A through G from County siting studies (excluding the proposed action)
    - CCSS Landfill
- Privatization Alternative(s)
- Proposed Action with Waste Management Modifications
    - Incineration
    - Recycling (including composting)
    - Volume Reduction (shredding or baling prior to landfilling)
- No Action Alternative

Each of these alternatives is briefly discussed below, with an indication of whether the alternative will be given full consideration in the EIS, or reasons why it has been eliminated from further detailed analysis. Alternatives given full consideration are evaluated for environmental impact in Chapter 4.0, and compared to other alternatives in Chapter 5.0. A summary of the alternatives initially considered, with rationale as to their efficacy for the EIS and potential for licensing, is presented in Table 2.1-5.

2.1.5.1 Proposed Action Alternative (Site E)

The Proposed Action for the EIS is to site a new 80-acre solid waste landfill at Site E. This action, more fully described in Section 2.2, would consist of a solid waste disposal facility located within a 320 acre parcel northeast of the City of Helena on undeveloped agricultural land. It would be situated on a topographic divide separating Hauser Lake from Lake Helena on gently rolling, treeless terrain, about one mile from the Helena Valley Regulating Reservoir.

The proposed Class II disposal site will have a design life of approximately 50 years. The original sequencing plan called for developing the landfill in three phases, with multiple areas in each phase for waste disposal; the revised application is for only phase I (80 acres) of this original plan. The Proposed Action as applied for and evaluated in this EIS is for an 80-acre landfill only, which would disturb approximately 80 acres and have a lifetime of about 50 years. According to the proposed design, each waste disposal area, or cell, will be excavated to general depths ranging from 0 to 30 feet with maximum

TABLE 2.1-5

SUMMARY OF ALTERNATIVES

Alternative	Consider in EIS or Eliminate	Rationale
No-Action	Consider	Required
Proposed Action (Site E)	Consider	Required
Waste Management Alternatives		
- Incineration	Eliminate	• High public concern re: emissions, health effects • Ash & residual waste site disposal problem • Cost
- Waste Reduction	Consider	• Public request for alternative waste management solutions • MEPA conformance • Modify proposed action
- Volume Reduction	Eliminate	• High cost • Lack of success in some locations • Low efficiency
Alternative Sites		
Site A	Consider	• Scored highest in evaluations • Public request • More data required • Within 10,000 ft of airport runway
Site B	Eliminate	• No relative advantages to full consideration • Poor geologic conditions • Likely not available for sale
Site C	Eliminate	• Seismic hazard conflicts with Subtitle D siting criteria • Poor geologic conditions • No relative advantages vs. other sites
Site D	Eliminate	• Seismic hazard conflicts with Subtitle D siting criteria • No relative advantages vs. other sites • Strong public concern over transport, visuals during siting studies
Site F	Eliminate	• Land not for sale; condemnation not appropriate
Site G	Eliminate	• Very low overall rating in siting study • Seismic hazard conflicts with Subtitle D siting criteria
Site H	Eliminate	• Low overall rating in siting study • Public opposition
CCSS Landfill	Consider	• Already permitted as solid waste landfill • Minimize number of impact sites in the area
Private Facility	Eliminate	• High transport costs for out-of-area option • Increased potential liability • Local approval if out-of-area required • If facility in study area, does not address siting issue

excavation of 41 feet. The cells will be lined with composite liner consisting of a two-foot thick compacted clayey-soil liner or a premanufactured geosynthetic clay liner either of which will be overlaid by a synthetic flexible membrane liner and equipped with a leachate collection system (Huntingdon 1993). The facility will be operated 7 days per week. Daily operations will include compaction of waste, daily cover application, and nuisance and stormwater control (Damschen & Associates 1990a). As the Proposed Action, construction and operation of a solid waste landfill at Site E has been given full consideration in the EIS. The plans for Site E are more fully described in Section 2.2.

2.1.5.2 Alternative Landfill Sites

Helena and Lewis & Clark County conducted a multi-year search for a suitable landfill site within or bordering Lewis & Clark County before selecting Site E as a preferred disposal area. This effort was described in Section 2.1.3. The methods used in selecting alternative landfill locations and screening these sites for appropriateness as a landfill were considered to be reasonable and generally valid. Because the eight candidate sites reviewed in the Phase I Siting Study represent a variety of locations and conditions within the study area, they were considered for evaluation in this EIS as an appropriate range of site alternatives. With the exception of the CCSS Landfill (described below), no new or previously undescribed site locations were considered in this study. Each of the eight candidate sites are shown in Figure 2.1-1.

The following paragraphs present a brief summary of the characteristics of the alternative landfill sites. Fatal flaws prohibiting use as a Class II landfill are described, along with other relevant siting phenomena. Rationale for either carrying a site through the EIS evaluations as an alternative, or eliminating a site from further consideration, are presented.

Site A - Located approximately one mile southwest of East Helena, Site A ranked as one of the top alternatives in the siting study. Strong public opposition was voiced regarding this site, however. It was noted in the scoping phase of the EIS that there was an inequitable amount of site-specific hydrogeological data available for this site. This data gap suggested that it would be difficult to provide comparable levels of impacts evaluation for all of the alternatives.

To correct this, additional field investigations were carried out by DHES in December 1992 (Montana DHES 1993). Based on the high ratings for this site in the previous studies, Site A is evaluated as an alternative landfill site in this EIS. Further description of Site A is provided in Section 2.3.

Site B - Site B is located on the Lewis & Clark/Jefferson County border, approximately two miles east of East Helena. It was rated as the third most suitable site overall in the final ratings. Site B's relative rating in the Phase II studies was low, at least in part because the economic cost analysis included expenditures for a liner, while Sites A and E did not. Subsequent review of the siting results, in light of newly promulgated federal and expected state regulations, indicate that every site considered would be required to install some type of liner. Therefore, Site B's overall rating would likely be higher.

However, two factors weigh heavily against the use of Site B as a feasible alternative. First, Site B has poor soil and geologic conditions for a landfill. The subsurface is very permeable, which means in this instance that water can quickly migrate downward. Even with an engineered liner system, there is justified concern that liquid from a leak in the landfill could relatively quickly and easily contaminate underlying drinking water resources. Second, it is unknown whether the owner of the Site B property would be willing to sell his land. Attempts by DHES to ascertain his position were unsuccessful. DHES does not feel condemnation proceedings to obtain Site B are a reasonable option in this instance, since other reasonable alternatives to the Proposed Action that display equal site characteristics have been identified. Therefore, Site B has been eliminated from further consideration.

Site C - Site C, located directly north of Site B, was rated fourth overall in the Phase II Siting Study, although a liner requirement probably skewed the economic rating in a similar manner as Site B. Seismic and fault information also contributed to the low ranking. RCRA Subtitle D, however, requires that a new landfill cannot be located in seismic impact zones or within 200 feet of fault areas. Also, site location in an unstable area requires mitigating measures. These requirements could effectively eliminate Site C (as well as Sites D and G) from consideration. In addition, Site C exhibits similar subsurface conditions as those described above for Site B. There is no clear advantage in considering Site C for future landfill operations, since it does not offer engineering features or environmental controls other sites do not provide. Therefore, Site C has been eliminated from further consideration.

Site D - Located approximately eight miles east of Helena, Site D received a rating equal to Site A in the Phase I siting study. It was not carried forward for detailed analysis, however, due to potential traffic and visual impacts. The siting study identified an inferred fault crossing the southwest corner of the site which, if present and active within the past 10,000 years, would eliminate Site D from consideration, or at the least require mitigating measures. Additionally, Site D offers no discernible advantage for landfill operation over other sites being considered. Site D is eliminated from further consideration.

Site F - Site F, located approximately 16 miles northwest of Helena, ranked relatively high in the Phase I study and was carried forward for detailed analysis in Phase II. However, the landowner withdrew his property from consideration, and the site was eliminated from further evaluation. Several public scoping comments questioned why Site F is not being considered as an alternative landfill site. One commentor noted that he had heard that Site F may now be available for a landfill, but this possibility was not explored in the EIS. As noted for Site B, condemnation proceedings to obtain this site are not warranted, in the opinion of DHES, since other alternative sites exist that offer equal or better engineering features and/or environmental advantages. Site F has therefore been eliminated from further consideration.

Site G - Site G is located about three miles north of Helena, immediately west of the existing Scratch Gravel District landfill. It rated relatively low in the initial site screening and was eliminated in Phase I. The proximity of Site G to the existing landfill, and ground water contamination from that landfill, would complicate facility monitoring requirements and closure of the Scratch Gravel facility. The presence of a fault on the border of the site, indicating potential geologic instability, supports the decision to eliminate this site from further consideration.

Site H - Located approximately five miles northwest of Helena, Site H ranked relatively low in the initial site screening and was eliminated in Phase I. It also received strong opposition during public meetings. Site H has been eliminated from further consideration.

CCSS Landfill - The CCSS landfill (formerly known as the Tenneson Landfill) is located in the north 1/2 Southeast, 1/4 Section 6, Township 9 North, Range 2 West, Jefferson County, Montana. The facility, currently in use as a solid waste landfill, is approximately 1½ miles south of the community of East Helena off Highway 518. DHES issued a license for this Class II facility on January 19, 1988. It serves both commercial and residential customers on a total area of 140 acres, 60 of which is licensed for landfill development. The CCSS operating license would have to be modified for the facility to receive approval to dispose the much larger waste stream from Helena and the Scratch Gravel District. The current manner of construction and operation at this facility would not be in compliance Subtitle D regulations, although a preliminary development plan outlining some improvements was prepared and furnished to DHES (Tenneson Landfill 1992). Still, significant upgrades would have to be made for this landfill to obtain the amended license. Information provided at a public meeting in Helena on February 4, 1992, suggest that Mr. Ben Sale, the new owner of the CCSS Landfill, proposes to develop a facility at the CCSS site which is in full compliance with Subtitle D requirements.

CCSS landfill was not included in the Damschen & Associates siting study. However, its use for future long-term management of Lewis & Clark County's solid waste has been supported by some members of the public throughout the scoping process. Others, particularly those residing in or near East Helena, are strongly opposed to further expansion of the facility. Ben Sale's proposed expansion of the facility would likely be contingent on the availability of Class II waste from Lewis & Clark County and/or Jefferson County. Jefferson County has already sought to prohibit Lewis & Clark County's use of this facility by issuance of a zoning ordinance limiting the expansion of the CCSS landfill, in effect prohibiting the facility from accepting waste not already included in their license.

A compelling argument for consideration of the CCSS facility involves privatization. In light of today's solid waste regulations which impose aggressive implementation schedules, municipalities often cannot afford to finance new waste management infrastructures. In addition, local governments need to minimize the risk associated with landfill management. The private sector may be able to make a profit by taking on this risk, and has access to private sector funds for short-term and long-term financing. Therefore, a public-private partnership can create a situation in which responsibilities can be assigned to the parties best able to deal with them. In addition, the Montana Solid Waste Management Act encourages the use of private industry to the maximum extent possible in planning, designing, managing, constructing, operating, manufacturing, and marketing functions related to solid waste management systems.

Based on these reasons as well as strong public support, the CCSS alternative has been given full consideration as an alternative to the proposed action in this EIS. Further information on the CCSS Landfill is provided in Section 2.4.

2.1.5.3 Privatization Alternative

Operation of a Lewis & Clark County landfill by a private vendor has been recommended as a potential alternative in some of the public scoping comments. Privatization would involve, among other features, a County contract to a vendor to operate and maintain the landfill. (Other options are possible, including contracting the landfill design, construction, and operation, to outright private ownership of the facility and transport vehicles). Waste could be collected and transported to the facility by the private company, the City, or the County. Reasons in support of private landfill operation were presented in the discussion regarding the CCSS Landfill, above. The CCSS landfill in Jefferson County is privately owned and operated. This landfill will be considered as an alternative for managing Lewis & Clark County's waste under a long-term contract with the County and/or the City.

No privatization option other than the CCSS site is evaluated as an alternative in this EIS. The reason for this decision is that management of the facility is not the primary issue of environmental concern; rather, the location of the landfill has been the main point of dispute. Privatization does not present an alternative as to how waste would be processed, or where the waste would be disposed. It merely transfers the management responsibility to a different entity.

Various commentators have recommended that the County consider shipping waste to a licensed facility outside the immediate area. An alternative of this sort has not been fully evaluated in the EIS, for a number of reasons. Transport costs would be increased dramatically to haul waste to a suitable facility.

Increased travel requirements increase the potential for accidents and risk to human health or the environment.

However, because there has been significant public and official interest in the feasibility of using an out-of-area, private facility for solid waste from the Scratch Gravel District and City of Helena, costs to transport and dispose wastes to Great Falls or Missoula have been calculated in Section 4.12 for comparison to alternatives involving sites within the project study area. For reasons explained in Section 2.1.5.5, this cost analysis is conducted as part of the evaluation of the No Action alternative. However, privatization for out-of-area sites has been eliminated from further consideration as an alternative in this EIS.

2.1.5.4 Proposed Action with Waste Management Modifications

This alternative would serve to modify, rather than mitigate, the Proposed Action. Recommended modifications include several waste management processes and combinations of processes. Each process has its own advantages, some are applicable to small municipalities in a predominantly rural setting. All of them depend on landfilling some part of the wastestream. These modifications would not necessarily impact the location of the site, but could alter the operation of the landfill and the volume of waste to be disposed. The result would be to prolong the landfill life, reduce costs, and comply with recent Montana legislation. Various methods were considered.

Incineration. Waste reduction through incineration is a well-developed technology which has been considered by the County since 1980. The advantages of incineration include a smaller land requirement, reduced impacts to surface and ground water (most degradable or leachable wastes are destroyed), and potential energy recovery or waste-to-energy (WTE) to offset high capital and O&M costs. However, incineration requires a consistent waste content and volume, which is often hard to maintain in a rural setting. In addition, noncombustible waste components, which were estimated in the Environmental Assessment to be 40 to 50 percent of the wastestream, would still require landfilling, as would ash by-products. This technology can also raise significant social and environmental concerns regarding air emissions and risks to human health.

The analysis conducted by SWSC in 1985 provides sufficient information to conclude that incineration is not a viable alternative because of economic and environmental concerns (refer to Section 2.1.3). This method of waste management has therefore been eliminated from further consideration.

Recycling and Composting. Both the Montana Solid Waste Management Act and Integrated Waste Management Act place a priority on recycling and composting. The latter has established a goal of reducing the volume of waste landfilled (or incinerated) by 25 percent between 1991 and 1996. In addition, MEPA requires the State to "enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources" (§75-1-103(2)(f), MCA). Co-composting of sewage sludge with leaves, branches, and grass was investigated by the County (Marshall 1990c). It was ultimately decided that composting would not occur at the proposed Site E (Damschen & Associates 1991a). During the scoping process, however, several requests were made by the public to include alternative waste management processes, including recycling and composting, in the EIS process. Additionally, the Helena Department of Health and Citizens Council has been pursuing composting over the last few months (Meister 1992).

Recycling processes will reduce the amount of waste requiring land disposal, and can be implemented in addition to landfill operation. These processes are probably most efficient if operated at, or in close proximity to, the landfill or a transfer facility. These systems are usually environmentally benign. Their success, however, is dependent upon market availability for the recycled product. Typical recyclables with a reliable market today include aluminum, paper, glass and some plastics. The City of Helena recently implemented a limited curbside program for residential customers and a mobile trailer for collection of various recyclables. Both the City and the County in 1993 instituted a blue bag collection program for recyclables through the normal waste collection and disposal procedures. These recycling initiatives will dovetail with a planned drop-off program at the new transfer station, which began operation for the City of Helena at a location near the existing City landfill in the Fall of 1993 (Damschen & Associates 1991a).

Composting helps to speed biodegradation of organic materials by providing moisture and oxygen for bacterial action. Various kinds of material can be composted, with the most common including yard waste, municipal sludge, or even mixed solid waste streams. Depending on the feedstock, this process can provide a volume reduction of 40 to 60 percent. A number of different composting methods are viable. A windrow system is the most likely to be implemented by the County due to low capital costs and O&M requirements. Odor can be a problem with composting, particularly when the feedstock is anything other than yard waste, and runoff and leachate must be controlled.

Recycling processes have been considered a Modified Proposed Action (Section 2.5). For the purpose of evaluation, it has been assumed that recycling and composting will be conducted at the transfer station and landfill site, respectively, in order to reasonably define environmental impacts. Recycling and composting are not evaluated as a separate alternative in Chapter 4.0 because they are processes equally applicable to any of the alternative landfill sites, and they are not directly relevant to the central issue of this EIS, which concerns the location of a new landfill. However, mention of the environmental benefits and/or impacts associated with these operations is made where appropriate.

Volume Reduction (including shredding and baling). Volume reduction methodologies, such as waste shredding or baling, are practical prior to landfilling to reduce volume and render the waste stream more manageable for compaction. Wastes that have been processed by these methods have less potential for later settlement. These processes can help reduce disposal costs, reduce nuisances such as rodents, flies, blowing litter and fires, and may reduce transportation requirements if conducted at the transfer station prior to hauling to landfill.

One potential problem with the degree of waste compaction achieved by these processes is that the time required for waste degradation to organic compounds could be extended over that needed for traditional landfills. Compacted waste will have less oxygen and moisture, conditions which typically help enhance biological decay of garbage. Also, bulky or explosive items cannot be shredded or baled, and usually must be landfilled. Shredding and baling systems are associated with high capital and operational costs.

These processes were evaluated coincidentally with the Phase I siting study (Damschen & Associates 1987). It was concluded that neither shredding nor baling wastes prior to disposal was appropriate for the County due to lack of success in Great Falls, high front-end and operation and maintenance costs, and labor-intensive operation. Therefore, volume reduction processes have been eliminated from further consideration in this EIS.

2.1.5.5 No Action Alternative

In accordance with MEPA policy and significant precedent, the No Action alternative must be fully evaluated in the EIS. No Action for Lewis & Clark County could be interpreted to mean expansion of one or both of the existing Class II landfills, if possible, or export of the County's waste. The first possibility would require further development of existing facilities with significant upgrades and licensing efforts. However, there is very little capacity at either of the area landfills, and each have created problems with environmental contamination. The export option may require intergovernmental agreements, which may present considerable logistical and political obstacles, and escalated cost to ratepayers to ship and dispose refuse outside the area in which it is generated.

The No Action scenario for this EIS is unique with respect to most MEPA evaluations. No Action typically signifies disapproval of a license application or proposed action, without implementation of an alternative action. In other words, No Action is the maintenance of the existing, current baseline environmental conditions. However, the practical result of a No Action alternative in this situation is a delay from decision making. Some action will be necessary to properly manage the solid waste currently being disposed at the Scratch Gravel and City of Helena landfills. Although this alternative and ramifications resulting from its implementation are further discussed in Section 2.6, only a qualitative assessment of impacts is presented for comparison to the other alternatives.

The alternatives carried forward for consideration in the EIS are described in more detail in the following sections. They include: (1) Alternative 1, the Proposed Action to site the landfill at Site E; (2) Alternative 2, to use Site A for the new landfill; (3) Alternative 3, to modify and upgrade the CCSS Landfill for use as the disposal facility for Helena and the Scratch Gravel Landfill District; (4) Alternative 4, the Proposed Action with Modifications using waste reduction and recycling technologies; and (5) Alternative 5, No Action.

2.2 ALTERNATIVE 1 - PROPOSED ACTION (SITE E)

This section presents a factual summary of the proposed action according to the original license application and subsequent submittals by the proponent. Additional information regarding the site conditions, taken from the application materials and other sources and references during EIS preparation, may be found in Chapter 3.0. Anticipated and potential impacts associated with this action are described in Chapter 4.0. Compliance with federal and state solid waste disposal regulations, also discussed in Chapter 4.0, is especially critical to the location, design, construction, operation, and closure of a new landfill.

The original design for construction, operation, and monitoring of the Site E landfill would not be fully compliant with the new Subtitle D requirements, which became effective October 9, 1993. The reason for this variance is that the original Site E application plans were developed prior to promulgation of the EPA's revised solid waste regulations. Minimum design criteria, operational standards, and monitoring requirements were unknown. The modified design committed to by the proponent is in compliance with newly revised state solid waste regulations and federal Subtitle D requirements. The regulatory status and compliance is more fully discussed in Section 2.1.2 and Chapter 4.0, respectively.

The proposed location has been discussed previously. The overall parcel is 320 acres, of which 80 acres would be used for landfilling, providing solid waste disposal capacity for the 40,000-person service area for approximately 50 years. A description of the proposed design and operational features has been provided elsewhere (Damschen & Associates 1990a, 1990b, and 1991a; Chen-Northern, Inc., 1990a, 1990b, 1990c; Dunleavy 1991a and 1991b; Hazen 1990; Marshall, 1990a and 1990c; and Huntingdon 1993), and is summarized below.

Site E and the area around it are in alluvial material derived from erosion of the mountains and higher regions surrounding the Helena Valley. Native soils are classified as clayey sand (SC) and clay (CH) for 40 feet below the ground surface (bgs). This material has a permeability ranging from $2.1x10^{-5}$ cm/sec to 2.2×10^{-8} cm/sec. Some of the soils at Site E are highly desirable for use as part of a low permeability, composite lining underneath a landfill, or as part of a cover on closed landfill cells to reduce water infiltration. Ground water depth has been observed at 28 to 160 below ground surface (bgs) within the 320-acre land area of Site E. Sediments in this area may be discontinuous, with frequent pockets or lenses of sand and gravels displaying higher permeabilities, resulting in a greater ability to hold and probably transport ground water.

2.2.1 Design Features

The 80-acre landfill would be divided into 12 discrete areas of approximately 5 to 6 acres each. The site will be excavated to an maximum depth of 41 feet. The final elevation of the site will rise approximately 40 feet above the actual terrain. No wastes would be placed within a 250-foot corridor, including the Montana Power Company electric transmission line that bisects the site. The following sections focus on the current proposed facility design and development.

2.2.1.1 Liner and Leachate Collection System

The original landfill liner design called for a two-foot thick soil liner of recompacted native clayey soils to cover the base and sides of all waste disposal areas. The native materials described above would be used. The liner would consist of four 6-inch lifts of compacted soil each, placed on scarified native soils six inches deep. The required maximum permeability of the liner is 1×10^{-7} cm/sec. The proponent has committed to constructing a composite liner at the proposed landfill that include adding a flexible membrane liner (FML) (60 mil high density polyethylene [HDPE]) on top of previously described compacted soil liner or on top of a premanufactured geosynthetic clay liner (GCL). The GCL proposed to be utilized in this design is Gundseal®, which is composed of bentonite clay bound to an FML of 20 mil HPDE (Huntingdon 1993 and Wordal 1993).

The base of the landfill would be constructed to drain to a low point that runs east-west through the central portion of the 80-acre disposal site. The base would have 1.5 to 2.0 percent grades running north and south to the low point. The east-west low point would also drain to the west.

Above the liner, a leachate collection system would be installed that includes a 1 foot thick drainage layer of gravel containing leachate collection laterals laid on the slopes described above. These laterals would consist of 6-inch PVC piping to channel leachate to concrete collection manholes. The laterals would be placed at approximately 250 feet on center. To prevent clogging, the laterals would be embedded in fabric-lined, gravel-filled trenches which could be accessed by cleanouts. The manhole capacity would be 425 gallons. Depending on the quantity of leachate collected during the early life of the landfill, increased capacity may be provided. Details for these systems are provided in the License Application drawings and submittals.

Due to the low amounts of moisture that fall in the area, it is unlikely that a significant volume of leachate will be generated, but the volume would be measured periodically. As the site progresses and the collection system grows, additional capacity for leachate storage would be added. The County would reduce the risk of a leachate spill by monitoring leachate levels closely, and having a pumper truck on call to handle overload.

2.2.1.2 Runon/Runoff Control

Due to the topography of the area, runon is not anticipated, with the exception of the north boundary of the previously labelled Phase I fill area. The current design includes a drainage ditch to be constructed around the Phase I fill area to divert this runon volume. The design also includes two stormwater detention ponds to manage runoff from the 80-acre landfill, on the east and west borders of the site. Each pond has been sized to handle the 25-year, 24-hour runoff event and would have an emergency overflow. The ponds would drain 70 acres (west side) and 35 acres (east side), and have capacities of 265,000 cubic feet (CF) and 140,000 CF, respectively. Prior to use, the native soils at the bottom of the detention ponds would be excavated and recompacted to provide a more impermeable base. Collected runoff would be disposed by evaporation and, if clean, discharge to the natural surface drainages. A disposal option would be to pump remaining water back to an inactive fill area.

2.2.2 Construction

A clay liner test pad would be constructed before the landfill liner to ascertain that the methodology and methods used meet the existing design criteria. These criteria, described in the license application, include physical properties of the materials such as particle size, moisture, density, plasticity and liquid limits.

The site has been designed such that the soil excavated during construction should equal or balance the waste quantities deposited. The excavated volume would provide more than enough daily and final cover over the life of the facility. It is not expected that imported soil would be needed during the on-going operation.

Until the first lift of waste is placed, all surface runoff will be diverted through a drainage channel, and collected in one of the detention ponds. A section would also be developed in each area for wet weather filling. The wet weather area would have a 12-inch drainage layer which would allow equipment to drive on the layer without compromising the overall hydraulic conductivity of the layer.

Equipment used for construction would include either a scraper or track loader to excavate soil ahead of liner construction as needed for daily, intermediate and final cover. A sheepsfoot compactor and track loader would be used to compact waste and soil. Vehicular traffic would not be allowed directly on top of the drainage layer until the first lift of waste has been placed over it.

A construction quality assurance and quality control (CQA/CQC) program was developed to specify test pad construction, testing frequencies, and oversight requirements for the liner and leachate system. The purpose of this program is to ensure that elevations, excavations, materials, and installation meet specifications approved by DHES. Additionally, certification that construction activities are in compliance with these specifications would be documented following construction.

2.2.3 General Operations

The Site E landfill would be operated by the Scratch Gravel Landfill District. It would be open seven days per week to trailers from the City of Helena's transfer station and other vehicles as approved by County personnel. Staffing would include a minimum of two full time employees (Board of County Commissioners 1993).

Group II and Group III wastes would be accepted. Wastes classified as hazardous by EPA, but generated by the small, nonregulated generators (i.e., household quantities and conditionally exempt) would also be accepted. No bulk liquid wastes would be accepted. Some "objectionable" materials would be accepted at the landfill, including sterilized infectious wastes, treated hospital wastes, dead animals larger than 100 lbs, sewage sludge, and screenings. Asbestos would be accepted from certified contractors and placed in a separate area of the landfill. Asbestos would be contained with daily cover material but not compacted. No special wastes that require unusual handling procedures or present unique environment hazards would be accepted. There would be no open burning at the site. Wastes would be compacted to about 1,200 lbs per cubic yard and contained within 15 to 60 minutes of deposition with six inches of daily cover.

The collection manholes would be inspected weekly for leachate generation, and more frequently after large storm events or heavy snow melt. Personnel would not enter the manholes. Accumulated leachate would be measured, and removed by a licensed septic tank pumper truck to be hauled to the Helena Wastewater Treatment Facility (HWTF) whenever the level exceeds two feet (new regulations would establish this threshold level at one foot). Recorded leachate levels and testing results would be maintained and reviewed yearly to determine whether the inspection schedule is appropriate. A leachate inspection log shall be submitted to the DHES on an annual basis.

All collection laterals would be cleaned (by flushing with pumping equipment or truck mechanical devices) after construction, after placement of the first lift, and annually thereafter. Liquid collected during cleanout procedures would be treated as if it were leachate and disposed at the HWTF.

Access road and haul routes would be maintained by the County Road Department. This includes repairs, plowing, and safety programs. The perimeter of the site would be fenced with a locked gate at the entrance to prevent unauthorized use of the landfill after hours. Access would be limited to transfer trailers and other vehicles that haul directly to the landfill as authorized by County. These will include licensed haulers, covered demolition loads, and loads of objectionable materials. One-time haulers of special loads would be given a single-use, dated permit.

2.2.4 Ground water Monitoring

A ground water monitoring plan was developed in response to DHES' Notice of Deficiencies in the license application (Hazen 1990). It provides for baseline sampling of on-site monitoring wells E-3, E-5, and E-6 and off-site domestic wells (DW-A, DW-C, and DW-E) prior to acceptance of waste materials at the landfill. Additional monitoring wells (E-7, E-8 and E-9) were installed at and around the site subsequent to submittal of the initial ground water monitoring plan. On-site wells would continue to be sampled semi-annually during active landfilling operations. E-3 is an upgradient well, and wells E-5, E-6, E-7 and E-8 are downgradient of Phase I, while E-9 appears to be crossgradient to Phase I. The limits of Phase I are coincidental with the compliance boundary (POC) of the facility. Sampling events would be scheduled to generally coincide with seasonal maximum and minimum ground water levels, anticipated to occur during May and November, respectively. Initiation of an approved ground water monitoring plan in compliance with existing State rules (ARM §16.14.701 *et seq.*) is required prior to acceptance of any waste at newly licensed Class II landfills in Montana.

Static water levels, temperature, Ph, and specific electrical conductance will be measured in each well to measure the direction of ground water flow and seasonal variation. Ground water samples are required be collected and analyzed for the following parameters:

- Antimony
- Arsenic
- Barium
- Cadmium
- Chloride
- Chromium
- Cobalt
- Copper
- Cyanide
- Iron
- Lead
- Mercury
- Nitrate (as N)
- Nickel
- Selenium
- Silver
- Sulfate (SO_4)
- Thallium
- Vanadium
- Zinc
- Chemical Oxygen Demand (COD)
- Ph
- The 46 volatile organic compounds (VOCs) specified in Table I of ARM §16.14.706 and Subtitle D.

Ground water level measurements, sampling, and documentation would be carried out in accordance with Standard Operating Procedures that will be part of the required monitoring plan. All laboratory analyses would be performed by a State of Montana-certified laboratory in accordance with appropriate EPA methods. Summary reports would be prepared for each sampling event for submission to DHES and an annual report is required for all landfill ground water monitoring. The state rules provide for a review and update of the approved ground water monitoring systems every five years to insure that an adequate system of monitoring wells is being utilized for monitoring landfills as time progresses. As noted in the introduction to this section, the design for and implementation of the ground water monitoring system would have to meet specifications outlined in 40 CFR Part 258, as described in Section 2.1.2.2, and state rules for ground water monitoring at municipal solid waste landfills (ARM 16.14.701 *et seq.*).

2.2.5 Nuisance Control

As presented in the 1990 license application, waste would be left exposed only a few minutes during each trailer dumping cycle before being compacted and contained with daily cover. This practice of rapid refuse cover is designed to reduce odor, reduce blowing litter, and minimize attracting birds or other wildlife. A perimeter fence, including barbed wire, would be constructed around the site. About ½ mile of fencing along Deal Lane would be rebuilt. The fence would provide security and help to control blowing litter. A hog wire fence would be added to the existing barbed wire fence at the northeast corner of the site (about 500 feet in each direction). The fence would be 6 feet high by 6 inches wide by 8 inches deep and strung on 5-foot posts placed 12 feet apart. A locked gate would be installed at the Deal Lane entrance.

A minimum of four portable 20-foot by 10-foot litter screens would also be used around the active filling area. Labor would be provided as necessary to hand pick litter that has accumulated on the litter screens, perimeter fences, and outside the landfill area. Wastes would not be landfilled on windy days but stored at the transfer station. Additionally, the Covered Load Ordinance implemented by Lewis & Clark County in 1991 would be adhered to for litter reduction on haul routes.

In order to avoid excessive noise at the Warren School, transfer trucks would be equipped with the best available mufflers. Mufflers would subsequently be replaced when their effectiveness declines to less than 75 percent of their original muffling capacity. Haul trucks would also be required to avoid compression braking, downshifting, and upshifting within the Warren School speed control zone. As an option, the truck traffic could be re-routed to Canyon Ferry and Wylie Drive, bypassing Warren School.

Dust would be suppressed with calcium chloride until the haul routes are paved. These routes include segments of Lake Helena Drive (from York Road to Deal Lane and from the Causeway to Deal Lane), and Deal Lane to the entrance of the landfill site.

2.2.6 Closure

According to the current design, final surfaces would not exceed a 3:1 slope. A final cover or cap would be applied over the closed waste disposal cell. This final cover must match the permeability of the bottom liner design utilized, in this case a composite cap consisting of 18 inches compacted soil overlaid by a synthetic FML would be necessary. Available topsoil would be stripped, reapplied, and reseeded after the landfilling has been completed in each area. The final use of the landfill is expected to be grazing. Although proposed final contours have been developed which include the final cover system, specific closure and post-closure planning has not been completed.

2.3 ALTERNATIVE 2 - SITE A

Site A is located approximately one mile southwest of East Helena and the ASARCO smelter (Figure 2.1-1). This site consists of about 80 acres which border at the Lewis & Clark County and Jefferson County line, near the upper end of a drainage approximately ½ mile northeast of Interstate 15. The property follows the drainage in a northeasterly direction. The land has been used for agricultural purposes, and there is a residential housing subdivision approximately 2/3 mile south of the site. It is believed that groundwater flows in a northeasterly direction, toward Prickly Pear Creek and following the general trend of the Helena Valley Aquifer (see Section 3.2).

Site A ranked as one of the top alternatives in the siting study. There was strong public opposition to this site when the County first recommended it as a candidate for the new landfill during public hearings. Additionally, it was noted in the scoping phase of this EIS that there was an inequitable amount of site-specific hydrogeological data available for this site. This data gap suggested that it would be difficult to provide comparable levels of impacts evaluation for all of the alternatives. To help correct the data deficiency DHES drilled a test boring at Site A in December 1992. A hydrogeological and soils characterization report was subsequently prepared (Montana DHES 1993).

For the purpose of this evaluation, it has been assumed that the entire 80-acre parcel will be used for landfilling. A portion of presently configured Site A is within 10,000 feet of an active runway of Helena airport. The Federal Aviation Administration (FAA) was contacted concerning this situation (Wilbur 1993a) and responded that the "FAA would object to the Site A location within 10,000 feet of the Helena Regional Airport." The FAA also stated "If Site A was located beyond the 10,000 feet from the airport and within the 5 mile radius, additional review would be required to determine whether the landfill would attract or sustain hazardous bird movements" (FAA 1993). The Subtitle D rules and state regulations prohibit siting a Class II landfill within the stated distance of an airport runway without a demonstration being made that the landfill would not pose a hazard to low flying aircraft as a result of birds congregating at and near the facility. The FAA's authority in these situations is derived from their Order 5200.5A which mandates airport owners comply with Federal obligations to protect compatibility of land uses around the airport.

2.3.1 Site Conditions

Site A consists of gently sloping hills dissected by a drainage which channels surface water (present during storms, snowmelt and high precipitation events) to the northeast. The site is not cultivated at present, although the land has been tilled, and native vegetation is reinhabiting the property. Predominant soils found in the vicinity of Site A are gravelly loam, silty and clayey sands, and gravelly clays. Surface material consists of partially solidified volcanic ash and sandy, reworked volcanic ash, occasionally covered by sandy gravel. A test conducted at the bottom of a test pit on site produced a vertical hydraulic conductivity of 2.5×10^{-5} cm/sec. Most of the underlying material at Site A down to the water table (detected at approximately 90 to 100 feet) consists of this volcanic ash. Permeabilities for the soils at the site could range from 1×10^{-3} to 1×10^{-8} cm/sec.

2.3.2 Design/Construction/Operations

Access to the site would be from Smelter Road. Damschen & Associates (1990b) estimated that an approximate 3,500 foot road would have to be built from Smelter Road to the initial fill area. A drainage diversion would be required to channel surface water from the upgradient end (southwest corner) around to the northeast boundary of the facility, the downgradient end. Stormwater control and overflow ponds would also be needed. Discharge permits would be required.

A design for Site A was not prepared, since the March 1990 license application is specific to Site E. However, it is anticipated that overall design of the facility would be similar to Site E. Site A could require less "cut" or excavation, due to the ravine nature of the setting and relatively high topography from the base of the cells. It is probable that a phased approach to construction and operation would also be used, with the initial cell constructed at the southwest end of the property and construction progressing to the northeast as cells are filled. As discussed in Section 2.1.2, the facility would require a liner of Subtitle D specifications. A leachate collection system would be used and probably gravity drained to the northeast, with laterals extending to the cells on either side of the ravine.

The landfill would be constructed and operated by the Scratch Gravel Landfill District. For the purposes of evaluation of environmental impacts and comparison to other alternatives, it has been assumed that the facility would be open seven days per week, with the same limits on waste types, disposers, refuse cover, and other operational factors as described for Site E in Section 2.3.1. Security measures would probably include fencing and a user permit system for waste disposal.

2.3.3 Ground water Monitoring

A ground water monitoring strategy for Site A has not been developed. In fact, more investigation of the property would be required prior to construction and operation to fully characterize the site and prepare a monitoring plan. Analytes to be tested would be the same as those listed in Section 2.2.4, and other basic information such as water levels, Ph, temperature, cations, anions, and electrical conductivity would also be required. The ground water monitoring program would have to comply with Montana rules for ground water monitoring at solid waste disposal facilities.

2.3.4 Nuisance Control

Nuisance control requirements would likely be the same as outlined for Site E. Fencing would restrict access and help control blowing litter. Rapid cover of refuse would reduce odor, reduce litter, and minimize the attraction of birds and other scavengers. It is assumed that the County would use the same noise controls as proposed for Site E.

2.3.5 Closure

Requirements and plans for closure would be similar to those described for Site E, including cover needs, and slope angles of reclaimed or covered cells. Site A may have to import low permeability cover (and liner) material, since there may not be sufficient quantities of suitable material on site. Additional field investigations would be needed to verify site conditions.

2.4 ALTERNATIVE 3 - City-County Sanitation Service (CCSS) LANDFILL

The CCSS landfill is located in northern Jefferson County on a 140-acre parcel that was expanded in 1990 with an additional 113-acre buffer area. The CCSS site is located about 4 miles from the Helena Airport, and complies with state and federal landfill siting criteria with respect to airports, although airport and FAA notification must be submitted (FAA has been provided a copy of the EIS for review and comment).

At full build-out, the landfill will be developed in three 20-acre plots or phases. It currently operates under License No. 296, issued by DHES in January 1988, which is valid for only the first 60 acres of development. This evaluation therefore considers landfill development on 60 acres only. The CCSS license does not include acceptance of the relatively large volumes of waste anticipated to be generated by the City of Helena and other applicable areas of Lewis & Clark County. A new or amended license would be required for this action to take place.

Summarized below are the contents of the license application (CCSS 1987), the preliminary environmental review (DHES 1988), a preliminary development plan (Tenneson Landfill 1992), and a work plan developed for future hydrogeologic investigation (Schafer & Associates 1992). These descriptions do not include plans presented by Ben Sale at a public meeting on February 4, 1993, since those plans were also preliminary in scope and had not yet even been submitted for consideration to DHES. However, it is anticipated that more detailed information regarding plans to upgrade the facility in compliance with Subtitle D will be forthcoming during review of this EIS.

2.4.1 Site Conditions

All land adjacent to the proposed landfill is presently used as farm and pasture land. There are no local zoning ordinances in force prohibiting the construction of a solid waste management system. However, Jefferson County has indicated strong opposition to Lewis & Clark County using this facility, including issuance of a zoning ordinance limiting facility expansion as a result of the disposal of waste from sources not already using the facility. See Section 2.1.5.2 for additional discussion.

The CCSS landfill area has a natural cover of up to 6 feet of deep, loamy soils, with some surface gravel beds, in a gently to moderately sloping terrain. The soils are usually silty loams or gravel. Hydraulic conductivity information specific to the CCSS Site was not available for this EIS, but conductivities typically range from 1.0×10^{-3} to 1.0×10^{-7} cm/sec for the soil types found in this area.

2.4.2 Design/Construction/Operation

The CCSS Landfill is an unlined facility using only the first 20 acres of the ultimate 60 acres available for landfilling. Proposed upgrades (Blue Ridge Services 1993) include a composite liner (permeability of soil component to be equal or less than 1.0×10^{-7} cm/sec); leachate collection system (drainage layer, perforated piping, and evaporation pond for storage); runon-runoff control for the 50-year, 24-hour storm event, sedimentation pond, and erosion control; and final cover system. As noted above, final modifications are expected to comply with pertinent state and federal regulations.

Access to the site would be from Highway 518, located west of the facility. An access road runs about 1½ mile from the Highway to the landfill. This road is well developed, but might require upgrade, including widening or paving to handle the additional truck traffic. The access road to the construction area is bordered by drainage ditches. Culverts exist at any natural drainage locations.
The CCSS Facility does not rely on topographic variation for waste cell development, as would Site E or Site A. The landfill technique currently employed for the disposal of refuse is a trench-type method (20 to 30 feet deep, and approximately 60 feet wide). Future operation will be the area method with 3:1 slopes and waste placed in 10-foot lifts. Topsoil and other excavated material is separated and stockpiled for use as daily final cover and on completed areas for revegetation. A crawler-tractor equipped with a front-end loader is used to spread and compact the refuse in 2-foot lifts over a 3:1 slope and will make at least five passes over the 2-foot lifts. At the end of each working day, a 6-inch depth of cover material is placed on the refuse cell.

Public use of the current landfill is prohibited. Access is controlled by locked gates and fencing that currently surrounds the property. Only commercial vehicles would be allowed access. Operating hours are Monday through Saturday, 8 a.m. to 5 p.m. Group II and Group III wastes are accepted. No salvaging or burning of wastes is permitted at the site without the DHES approval. A contingency and emergency procedures plan has also been developed for response to spills or accidents.

The landfill would continue to be constructed and operated by a private firm. Donna Tenneson owned the facility until 1992, when it was sold to Mr. Ben E. Sale. Donna Tenneson, owner of CCSS, is at this time still responsible for facility operation. For the purposes of evaluation of environmental impacts and comparison to other alternatives, it has been assumed that the facility would be open seven days per week, with the same limits on waste types, disposers, refuse cover, and other operational factors as described for Site E in Section 2.3.1.

As discussed, some or many of these design, operation, and construction methods would likely to modified in the event this facility were to begin handling the solid waste generated by Helena and the Scratch Gravel District.

2.4.3 Ground water Monitoring

Four monitoring wells have been installed at the site. Three of the wells are relatively deep, ranging from 220 feet to 260 feet bgs. The fourth well is dry, completed in shallow gravels at a depth of about

30 feet. Well logs indicate that as much as 100 feet of clays and silts overlay the water producing zone. Static water levels measured from the three wells range from 100 feet to 180 feet bgs. Ground water flow is believed to be to the northwest across the site, following the general trend of the flow in the Helena Valley aquifer. The CCSS site is within the general recharge area of the Helena Valley aquifer.

Analytes to be tested in ground water monitoring would likely be the same, and at the same frequency, as those listed in Section 2.2.4, and other basic information such as water levels, pH, temperature and electrical conductivity would also be required. The ground water monitoring program would have to comply with pertinent state and federal rules for ground water monitoring at solid waste disposal facilities. The current monitoring program for the CCSS site is not in compliance with Subtitle D, but it would likely be upgraded. Wells would be sampled by qualified individuals, and analytical results compared against baseline data established prior to start-up in 1987.

Details on the ground water monitoring plan to be implemented are found in the Work Plan for the Hydrogeologic and Soils Study, City-County Landfill (Schafer & Associates 1992).

2.4.4 Nuisance Control

Litter control would be accomplished by prompt compaction and covering of waste material. Permanent fences would be constructed on the property boundaries to a minimum of 8 feet in height, with portable screens to be placed downwind of the working face. Loose litter around the working face and adjoining properties would be picked up and the area constantly policed. Additional snow fence barriers would be added on the exterior to capture escaping litter. Portable fence units would be placed side by side along each trench to control blowing paper. Dust would be controlled by water or other measures as appropriate.

2.4.5 Closure

The site will be provided with a final cover system consisting of a minimum of 2 feet of compacted soil. The CCSS site would likely have to import low permeability cover (and liner) material, since there may not be a source of suitable material on site. The anticipated end use of the property is a return to its present use as rangeland. It is unknown whether plans have been developed to comply with the post-closure requirements of Subtitle D.

2.5 ALTERNATIVE 4 - MODIFICATION TO THE PROPOSED ACTION

2.5.1 Integrated Waste Management

The EPA first established a preferred solid waste management hierarchy in 1990. This hierarchy has been adopted by many states, including Montana (Montana Integrated Waste Management Act of 1991). It contains the following priorities:

1. Source reduction (primary emphasis)
2. Reuse of waste
3. Recycling
4. Composting
5. Landfilling and incineration (least emphasis)

The integrated approach evaluated for the Waste Management Modification to the Proposed Action includes recycling and landfilling. For the purpose of this document, recycling has been defined to encompass both materials recycling for reuse and yard waste composting efforts.

As a modification to the Proposed Action, it is assumed that recycling will occur at the Helena transfer station, and composting at the landfill (although it is possible for composting to be implemented at the transfer station or some other location as well). Both processes could be operated in conjunction with an approved landfill at any of the landfill site alternatives. It is expected that they could be licensed through modification of the transfer station license and landfill license applications.

2.5.2 Materials Recycling

Recycling is broadly accepted as an important component of integrated solid waste management. Operating requirements and economics are the primary consideration in developing a recycling program. Environmental impacts are minimal, as surface water control and ground water contamination are not generally associated with recycling activities. Noise from glass handling may impact nearby residents, however.

The most limiting constraint on any recycling program is market availability for the recycled materials. Although recycling was originally anticipated as a money-making venture, the reality is that it is often at best a break-even operation. An often overlook advantage, however, is the avoided cost of landfilling the recycled material. Currently there is an almost unlimited demand for recycled aluminum. There is a very good market for old cardboard in this area, since the Stone Container plant west of Missoula recycles it for use in linerboard. Some plastics also enjoy a relatively good market advantage. There is a glut, however, of some materials such as newspaper, which often requires recyclers to pay for its removal (Rathje and Murphy 1992). The ability to recycle glass has diminished, possibly because the large volume of glass being turned in for recycling has exceeded capacity.

This EIS has evaluated the on-site recycling activities included in the operation plan/license application for the transfer station (Damschen & Associates 1991a). A license for this facility was granted in May 1992. It would complement the Helena curbside program, which currently provides collection from residences in the city. As indicated in the operation plan, this facility will be a passive drop-off center where residents, primarily from the unincorporated County (and without a curbside program), will place source-separated materials in designated bins.

2.5.3 Composting

Most composting systems process yard waste, which typically comprises 20 percent of the municipal solid wastestream by weight (Rathje and Murphy 1992). Twenty percent translates to approximately 8,000 TPY for Lewis & Clark County. This volume is high, however, and likely to be closer to 2,000 to 4,000 TPY. Varying proportions of food wastes, wood wastes, paper, sludge, and manure have been successfully co-composted with yard wastes. Although some composting systems incorporate the overall solid wastestream with only modest removal of bulky objects, these systems have experienced difficulties with odor and vector control, problematic operations, and a contaminated end-product.

The landfill license would have to stipulate approval for composting of yard waste. Composting of any other materials, such as food wastes or sewage sludge, would require DHES approval and modification of the landfill license.

The processing technology available for composting includes three primary types: windrow, aerated static pile, and in-vessel systems. Although the static pile and in-vessel systems require shorter processing times, mechanical turning, and high end-product quality, they are also associated with high capital costs and labor-intensive operations. As a result, they are not as appropriate for small municipalities as the windrow system.

The evaluation of a composting system in this EIS is based on the assumption that only yard wastes, including grass clippings, leaves, and brush would be accepted by the County, although some comments are provided in the impacts analysis (Chapter 4.0) regarding composting of other materials such as waste sludge. The compostable materials will be collected at the transfer station and hauled to the landfill, containerized or bundled in a manner to accommodate typical composting equipment, and processed in a windrow system.

2.5.3.1 Typical Design and Construction

By diverting yard wastes away from the landfill, the life of the existing landfill could be extended. Alternatively, the footprint could be reduced to maintain the same lifespan currently estimated. This advantage will be offset by the acreage needed to operate the windrow system. An additional benefit will be the composted material, which can be distributed or sold to agricultural and horticultural businesses. Although some of the materials may be consumed by homeowners, this volume is not expected to be large.

Typical design features would include the following:

- Storage Pad and Cover - pad with berms to contain runoff for temporary storage of incoming waste materials, optional cover to prevent excessive moisture prior to windrowing
- Windrow "Liner" - compacted clay, graded for runoff control, possibly bermed to prevent runon
- Detention Pond - for storage of contaminated runoff, may use one of the landfills ponds
- Ground Water Monitoring Wells - to monitor potential contamination of ground water, may duplicate some of those used for landfill
- Water Supply Well - to supply and control moisture content. Of primary concern in this area is that composting piles dry out, drastically reducing the rate of bacterial activity.

2.5.3.2 Typical Operation

Windrowing consists of placing waste into long rows. The rows vary in size, but are generally about 6 to 8 feet high and 15 to 25 feet wide at the base. Length will depend on the volume of material. Once this system is in full operation, cured material will be ready for reuse and removed from the site at a rate equivalent to the rate of incoming waste. It is expected that the composting facility will be constructed and operated at the southern end of Site E.

Initially, the waste material is "debagged," shredded, and sometimes "destoned" prior to placement in windrows. This removes plastic contamination, increases the percentage of fines, and removes large inorganic contaminants. A bulking agent, such as wood chips or dry leaves, may be added to control moisture and increase manageability.

In the first stage, the windrows are turned every few days to provide aeration and temperature control, and water is applied to maintain an optimal moisture content. This typically lasts for several weeks, and allows primary biodegradation to occur. The second, or curing stage includes stockpiling the degraded material for several more weeks to months. Adverse environmental impacts may result if these operations are not carefully controlled.

Operation of the compost system will coincide with running the landfill. The access road, gate, scale, and office building maintenance; ground water monitoring; nuisance control; and safety and emergency response procedures will be the same. Divergent operations will include additional labor, equipment needs, water application, and management of potentially contaminated surface water.

Labor - Although daily operations should not be significant, incoming waste will need to be stockpiled and windrowed. It is likely that at least one additional equipment operator will be necessary to manipulate the waste, apply water, and maintain facility records.

Equipment - Equipment requirements for the compost system will require, at a minimum, a front-end loader to move waste materials and aerate the windrows. The loader may be used jointly with the landfill. Eventually, most compost system owners invest in a windrow turner to improve efficiency and material consistency. Optional equipment will also include a debagger, shredder, and screen for purifying the end product.

Water Application - Water will likely be needed on a periodic basis to maintain the optimum moisture content for biodegradation. Water may come from wells or retention ponds already on site for stormwater runoff.

Runoff Control - Precipitation that comes in contact with waste materials within the windrows will become leachate. Additionally, free-draining water from the waste itself, or water applied to maintain an acceptable moisture content, will become leachate. Leachate will be diverted for short-term storage and off-site disposal. A detention pond, separate from that used to control clean runon to the landfill, may be necessary. It is possible that one of the landfill detention ponds could also be used for this purposed.

2.6 ALTERNATIVE 5 - NO ACTION

2.6.1 Continued Use of Existing Landfills

The existing Class II landfills in Lewis & Clark County that currently receive municipal solid waste have been described elsewhere. The near-capacity status and ground water contamination problems of these facilities have also been presented.

Expansion of existing, licensed facilities located in an environment that is already contaminated, could be a valid alternative to siting a new landfill. However, if the No Action alternative is interpreted to mean continued use of these landfills, many compliance activities would be required. In order to pursue this alternative, it would have to be assumed that one or both of these landfills will provide adequate, long-term capacity for solid waste management. The DHES Solid Waste Management Program has indicated this is not the case, and that neither the Scratch Gravel Landfill or the Helena Landfill could undergo any expansion for significantly increased capacity under present license conditions.

Montana is an approved state with respect to enforcement and oversight of federal solid waste landfill regulations (Subtitle D)(i.e., the existing state regulations have been modified consistently with the federal rules). Subtitle D rules mandate that existing landfills come into full compliance within the next five years, although some requirements will be effective immediately. Section 2.1.2 and Table 2.1-1 identified the specific regulatory requirements. Compliance activities may include:

- Remediation of existing contamination at the Scratch Gravel and City Landfills
- Evaluation of available, suitable adjacent land at one or both landfills for adequate capacity

- Evaluation of location with respect to siting criteria, and mitigation as necessary
- Design and construction of lateral expansion including Subtitle D liner, leachate collection system, and drainage controls
- Establishment of POC and upgrade of existing ground water monitoring program
- Upgrade of operations to include gas monitoring and incoming waste monitoring
- Preparation of closure and post-closure plans
- Establishment of financial assurance
- Issuance of operating license from DHES

Even if DHES were to support a license for such an expansion, the required regulatory modifications and the remediation efforts would be extensive and costly. A high degree of public opposition to further use of either facility is also likely.

2.6.2 Exporting Waste

The second possible interpretation of the No Action alternative includes export of the County's solid waste to existing, licensed facilities in neighboring counties. (As the CCSS Landfill in Jefferson County was considered as a separate alternative in Section 2.4, it will not be addressed under the No Action alternative.) Suitable landfills outside of Lewis & Clark County might include the Great Falls or Missoula facilities.

According to DHES, both counties have indicated a willingness to allow the private landfills to accept wastes from Lewis & Clark County. Also both owners/operators of these facilities have bid on transporting and accepting for disposal of wastes from the City of Helena Transfer Station. The Waste Management owned High Plains landfill near Great Falls is presently contracted to provide this service to the City (Waste Management 1993). See Section 3.12.3.3 for more discussion of this contract.

Limitations imposed by the receiving facility in either region may require Lewis & Clark County to have additional storage requirements, which may impact the size and operation of the licensed transfer station in Helena. It is also possible that tipping fees for imported Lewis & Clark County wastes will be higher than those for local residents. In addition, the transportation costs from the transfer station to the landfill will increase significantly as a function of longer haul routes, road maintenance, and additional safety measures. Additional environmental impacts will include the noise, safety issues, and vehicular air pollution associated with increased transportation.

Finally, Lewis & Clark County's liability for solid waste management will be increased. Imported waste at the receiving landfill will be combined with waste materials from other communities, and the Lewis

& Clark County will have no control over operations. Therefore, the County will not be able to minimize its risk from disposal of hazardous substances and potential release of contaminants in the future. In light of recent judicial rulings, which have found municipalities liable under CERCLA, this can be a serious issue.

2.7 RELATED DEVELOPMENT ACTIVITIES

2.7.1 Transfer Station

Analyses of a City of Helena transfer system was completed as part of the Phase I study (Damschen & Associates 1987) and subsequently revisited in an analysis conducted in 1990 (Damschen & Associates 1990c). These analyses concluded that the City should consider a transfer station because the proposed landfill would be located outside of the Helena city limits. It was also determined that a concrete push pit/loose haul facility should be constructed, and available for access by residents. The facility would provide nuisance control from blowing litter and birds. In May 1991, the City of Helena submitted an operation plan and license application for the transfer station (Damschen & Associates 1991a). A license was issued in May 1992. The facility was constructed in 1993 and began operation November, 1993.

The transfer station is located immediately north of the scale house at the existing City of Helena's landfill site. The site is bordered on the north by the Montana Rail Link, on the east by the City landfill, on the south by Carroll College and on the west by Elk River Concrete. The site encompasses approximately 7.7 acres.

The land on which the transfer station is located is owned by Washington Corporations of Missoula, the station is owned and operated by the City of Helena. According to the planning and application documents, the service area for the transfer facility will include the City of Helena and the Scratch Gravel Landfill District, with an estimated population of approximately 35,000 and waste generation rate of 40,000 TPY. The facility will handle approximately 110 tons per day. It has have a storage capacity of approximately 3 days of waste during the winter months and 1½ days during the spring and summer.

The transfer station includes two drive-in unloading areas that adjoin a concrete pit that is 40 feet wide by 100 feet long by 8 feet deep, and a transfer trailer loading area. Waste dumped into the pit will be pushed into a 110-cubic-yard open top transfer trailer. Once the trailer is filled with waste, hydraulically operated lids will be set in place on top of the trailer, and the trailer transported to the landfill for disposal.

The facility has a used oil storage tank located near the scale house for use by household generators. No service stations or other commercial businesses will be allowed to dump their oil at this facility. The City has also incorporated a volunteer recycle program into the design of the facility. Several containers have been placed near the scale house for individuals to deposit various recyclable materials, including white goods or appliances. The City will empty the containers as needed and transport the wastes to a market outlet, such as Montana Recycling.

2.7.2 Open-Cut Mining at Site E

Lewis & Clark County submitted an application in September 1992 to the Montana Department of State Lands (DSL) to mine 40,000 cubic yards (CY) of clay borrow material from Site E. The clay would be transported to the Scratch Gravel and Helena Landfills for use as capping material. Approximately 8.5 acres of Site E would be impacted, including the clay pit, access road, and topsoil stockpile. A summary of the County's proposed operation, taken from the Final Environmental Assessment (Department of State Lands 1992), follows.

About 24 inches of topsoil, totaling approximately 17,000 CY, would be stripped from the pit area on about 5.4 acres and stockpiled on an adjacent 2-acre area south of the clay pit. About 40,000 CY of clay would be removed from the pit using a scraper or bulldozer, and hauled away in trucks to either of the two existing landfills. Hauling would be scheduled to avoid periods of heavy traffic on roads and streets, and activity at the Warren and Four Georgians schools. A 2,300-foot-long access road would connect the pit with Deal Lane. The road would have a 12-foot wide running surface, with a 20-foot-wide alignment. About 1.05 acres would be stripped of 24 inches of topsoil for the road way, totalling 3,400 CY yards, and the topsoil would be stockpiled at the pit.

Within one month of cessation of operations, the site would be recontoured to blend into the surrounding topography and topsoil would be respread on the pit and access road. Reclamation would be conducted using range grasses and forbs. Seeding and mulching with straw would be completed within one week of topsoil respreading.

DSL evaluated the environmental impacts of this action, including cumulative effects possibly associated with later development of the landfill. The Department determined that there would be little relationship of impacts from the mining to effects caused by the landfill development. Although the mining operation should have ceased, and reclamation taken place, by the time landfill construction begins at Site E if it is licensed, DSL would require an amendment to the mine permit for a change in post-mine land use. Eventually, the clay mined area would be obliterated by the landfill development. If the landfill is not licensed, the land will have been reclaimed.

This activity is related spatially to the Site E Proposed Action. Although DSL has conducted an environmental evaluation of effects and potential cumulative effects, this EIS also evaluates the impact on Site E development and economics caused by the removal of approximately 40,000 CY of material which could otherwise be used as liner or cap material at a Site E landfill. This evaluation is contained in Section 4.1.

2.7.3 York Road Improvements

York Road is a two-lane paved road that passes land used mostly for rural residences and agricultural or grazing uses. Single family homes are found along the route. York Road would be a necessary part of the haul route for refuse trucks to travel from the transfer station in Helena to Site E.

The County authorized a realignment of York Road near the Warren School because of concerns about the safety of the "Warren Curve," especially due to the proximity to the school. Construction and realignment was completed in 1992. Evaluation of the impact of this action, if any, relative to previous concerns about truck traffic near the school and on York Road, is included in Section 4.9.

3.0
AFFECTED ENVIRONMENT

An analysis of the potential environmental impacts of Lewis & Clark County's proposed landfill, at Site E or one of the alternative sites, requires an understanding of the current status of the environment. This chapter of the EIS includes a review of current environmental conditions for a variety of environmental resources. Together, these topics encompass a range of social, economic, and natural resources which comprise the affected environment for this project.

The landfill site proposed by Lewis & Clark County (Site E), and each of the alternative sites selected for detailed consideration in the EIS (Site A and CCSS Landfill) are located east of the City of Helena, in the Helena Valley of west-central Montana. The study area for this EIS lies within the Helena Valley, an intermontane basin in the north-central portion of the Northern Rocky Mountains physiographic province (Briar and Madison 1992). The study area is generally bordered by the Missouri River and various reservoirs to the east and north, Interstate 15 to the west, and the Boulder Batholith (a large igneous rock intrusion) to the south.

The relative proximity of the alternative sites within the Valley (within approximately seven miles or less of one another) allows generalized descriptions of many of the natural resources to be applied to all of the sites. For instance, many wildlife species are common to all of the sites, and natural vegetation is generally similar. The climate for each of the sites is similar, if not very nearly the same. However, other resources such as surface water and recreation are site-specific and require separate descriptions in the affected environment for each site alternative. For instance, air quality may vary at each site due to the presence of industrial sources, population density, and road traffic.

3.1 SOILS AND GEOLOGY

Information on the geology of the Helena Valley has been collected and reported by the U.S. Geological Survey, the Montana Bureau of Mines and Geology, and Seismological Society of America. Geological features of concern for landfill site evaluation include surficial geology, soil types, faults, and earthquake hazards. Soils data used for this section are from the Soil Conservation Service and a report prepared for ASARCO's smelter facility in East Helena. References used in development of this section include: Briar and Madison 1992; Bingham *et al* 1991; CH_2M Hill 1987; Knopf 1963; Lorenz and Swenson 1951; McClernan 1983; Schmidt 1986; Stickney 1987; Becraft 1958; and Stickney and Bingler 1981.

3.1.1 Study Area Soils

Soils in the Helena Valley and study area developed on deposits known as "valley fill," which are derived from the erosion of surrounding mountain ranges, and on lake sediments of Tertiary age. Generally, the soils are composed of silts and clays and are moderately calcareous, with minimal organic matter. Soils in the Canyon Ferry Lake area, east of Helena, contain tuffaceous materials of volcanic origin. Soil profiles are not well developed, meaning that the chemical, physical, and biological weathering of the parent material has not been completed; or that certain elements of good soil development, such as the presence of organic material, are not present. Parent material for these soils do not typically contain significant quantities of lead, cadmium, arsenic, or zinc, or other heavy metals or metalloids. Some soils in the vicinity of the ASARCO plant in East Helena, however, have been contaminated with heavy metals, arsenic, and sulfur.

Since the Valley is semi-arid (approximately 12 inches of precipitation per year), agriculture includes both irrigated and dryland production of forage and grains such as wheat, barley, and oats. Much of the valley is rangeland consisting of grassland, which is used for livestock grazing. These grasslands are mixed with pine and fir trees in upland areas. Grassland soils consist of alluvial mollisols, inceptisols, and entisols. These are primarily loamy soils with some gravel and clay components, formed on alluvial fans, stream terraces, and uplands.

Table 3.1-1 presents the Unified Soil Classification System used in this description of the soils in the study area. This table has been modified to include engineering parameters such as grain size, drainage and compaction characteristics, slope and permeability values, which are critical to landfill design. An interim report of a soil survey and interpretation of the survey results for the Helena Valley, and part of Lewis & Clark County, by the U.S. Department of Agriculture (USDA) and Soil Conservation Service (SCS) provided soils information for this report. Soils analyses were conducted for Sites A, B, and E as part of the landfill siting studies. A 1987 study by CH_2M HILL regarding the ASARCO Smelter Superfund Site was also a source of information.

3.1.2 Soil Conditions at Alternative Sites

Soil properties which affect landfills include soil slope, soils texture, and soil consistency. Texture and consistency determine the degree of workability of the soil when both dry and wet. Plastic, sticky soils are difficult to excavate, grade, or compact. Permeability and compactability of soils are important characteristics, particularly if the material is to be used as subgrade material. A low permeability soil, with high proportions of clay-sized material, would be desirable in a bottom liner. The A horizon, which characteristically contains the highest content of organic matter and is easily worked, is most conducive to plant growth. This type of soil would be useful as a final cap on a landfill if a shallow-root, vegetative cover is going to be established.

The following sections describe the soil conditions at each of the sites being evaluated in this study. The amount of detail does vary between sites, reflecting some inconsistency in the level of investigation applied. Section 4.1.6 evaluates the usefulness of the soils at each relative to landfill construction, operation, and closure.

3.1.2.1 Proposed Action - Site E

Site E is located on an uplands setting representing terrace and alluvial fan deposits, with gentle slopes varying between 2 to 8 percent. Native vegetation is absent; the entire site is under cultivation and used as cropland. Soils in this portion of the study area are described by the SCS as a heavy soil consisting of sand, clayey sand, sandy clay, and some gravel. The major soil types represented at Site E are classified as SC, sand with clay, and CL, clay with fine sand. Based on lab analysis of these materials, the CL soil consists of over 60 percent clay-size particles, while the SC soil tests yielded less than 40 percent clay. Lab tests performed on the clay indicate that it is highly plastic. The upper 5 feet, in descending order, typically consists of 5 inches of loam to sandy loam; 5 to 10 inches of clay to sandy clay loam; underlain by up to 50 inches of sandy loam. This soil is moderately to very deep, well drained and moderately sodic and saline. Permeability is low to moderate.

TABLE 3.1-1 UNIFIED SOIL CLASSIFICATION SYSTEM AND CHARACTERISTICS PERTINENT TO SANITARY LANDFILLS

MAJOR	DIVISION	SYMBOL	SOIL NAME/DESCRIPTION	DRAINAGE CHARACTER	EMBANKMENT VALUE	PERMEABILITY (Cm per sec)	COMPACTION CHARACTERISTIC	AASHO[1] (Lb/cu ft)
COARSE GRAINED SOILS	GRAVEL & GRAVELLY SOILS	GW	Well-graded gravels or gravel-sand mixture	Excellent	Very stable	$k > 10^{-2}$	Good; tractor, rubber-tired, steel wheeled roller	125 - 135
		GP	Poorly graded gravels; gravel-sand mixtures	Excellent	Reasonably stable	$k > 10^{-2}$	Good; tractor, rubber-tired, steel wh roller	95 - 120
		GM	Silty Gravels; gravel-sand-silt mixtures	Fair - poor	Reasonably stable	$k = 10^{-3} - 10^{-6}$	Good; w/close control, rubber-tired, sheepsft	120 - 135
		GC	Clayey gravels; gravel-sand-clay mixtures	Poor - almost impervious	Fairly stable	$k = 10^{-6} - 10^{-8}$	Fair; rubber-tired, sheepsfoot roller	115 - 130
	SAND & SANDY SOILS	SW	Well-graded sands or gravelly sands	Excellent	Very stable	$k > 10^{-3}$	Good; tractor	110 - 130
		SP	Poorly gradded sands or gravelly sands	Excellent	Reasonable stable	$k > 10^{-3}$	Good; tractor	100 - 120
		SM	Silty sands; sand-silt mixtures	Fair - poor	Fairly stable	$k = 10^{-3} - 10^{-6}$	Good; w/ close control rubber-tired, sheepsft	110 - 125
		SC	Clayey sands; sand-clay mixtures	Poor - almost impervious	Fairly stable	$k = 10^{-6} - 10^{-8}$	Fair; sheepsfoot roller rubber-tired	105 - 125
FINE GRAINED SOILS	SILTS & CLAYS (LL<50)	ML	Inorganic silts/v fine sands; silty or clayey fine sands; clayey silts	Fair - poor	Poor stability	$k = 10^{-3} - 10^{-6}$	Good - poor; close control essential, rubber-tired roller	95 - 120
		CL	Inorganic clays, low - med plasticity; gravelly clays; sandy/silty clays	Practically impervious	Stable	$k = 10^{-6} - 10^{-8}$	Fair - good; sheepsfoot roller, rubber-tired	95 - 120
		OL	Organic silts & organic silt-clays, low plasticity	Poor	Not suitable for embankments	$k = 10^{-4} - 10^{-6}$	Fair - poor; sheepsfoot roller	80 - 100
	SILTS & CLAYS (LL>50)	MH	Inorganic silts; fine sandy or silty soils; elastic silt	Fair - poor	Poor stability	$k = 10^{-4} - 10^{-6}$	Poor - v poor; sheepsfoot roller	70 - 95
		CH	Inorganic clays of high plasticity, "fat" clays	Practically impervious	Fair stability	$k = 10^{-6} - 10^{-8}$	Fair - poor, sheepsfoot roller	75 - 105
		OH	Organic clays of med to high plasticity; organic silts	Practically impervious	Not suitable for embankments	$k = 10^{-6} - 10^{-8}$	Poor - v poor, sheepsfoot roller	85 - 100
ORGANIC	SOILS	Pt	Peat & highly organic soils	NOT	RECOMMENDED	FOR	SANITARY	LANDFILL

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[1] Compacted soil at optimum moisture content for Standard AASHO (Standard Proctor) compactive effort

SOURCE: Brunner & Keller 1972

The 19 test pits excavated at Site E encountered sand, clayey sand, sandy clay and a minimal amount of gravels. Abundant permeability data are available for Site E, primarily from the Phase I and Phase II siting studies. Three test methods were used to evaluate permeability; double-ring infiltration, pump-in or slug tests, and a laboratory permeameter. Base materials tested indicate Site E has relatively low vertical hydraulic conductances, suggesting that downward migration of fluids would be slow. The double-ring infiltration tests yielded vertical hydraulic conductance of 2.1 x 10^{-5} cm/sec for the clayey sand, and 8.8 x 10^{-7} cm/sec for the sandy clay. These tests were conducted on site at depths of 10 to 12 feet. Slug tests yielded horizontal hydraulic conductances of 1.2 x 10^{-7} to 6.8 x 10^{-7} cm/sec. Hydraulic conductance of the subsurface sand and gravel lenses, as derived from slug test data, range from 2.8 x 10^{-3} cm/sec to 8.2 x 10^{-6} cm/sec. Laboratory permeameter tests of a CL-type soil indicated a hydraulic conductivity of 2.0 x 10^{-8} cm/sec, while the same test method on a SC-type soil yielded a hydraulic conductance of 1.0 x 10^{-7} cm/sec.

3.1.2.2 Site A

Site A occurs on uplands and alluvial fan terraces. Overall topographic relief is gently sloping. Site A is not under cultivation, although it has been in the past, and native vegetation, including sage, is being reestablished. The predominant soil types in the vicinity of Site A are (1), a light, complex soil which occurs on the gentle (2 to 8 percent) slopes, and (2), in areas with steeper slopes (4 to 35 percent), a similar type soil but more of a gravelly loam. Both soil types are surface loams (0 - 4 inches) underlain by up to 3 feet of gravelly loam and gravelly sandy loam, with up to 10 percent coarse fragments throughout the profile. These are considered light soils by the SCS, and their properties are characteristically very deep and well-drained, with low moderate permeability. Overall, several soil types do occur at Site A, including the gravelly loam (GM), silty and clayey sands (SM and SC, respectively), and CL soils. Their engineering characteristics relative to landfill design are shown on Table 3.1-1.

Surficial material at Site A consists of partially lithified (solidified) volcanic ash and sandy, reworked volcanic ash, occasionally overlain by sandy gravel. A double-ring infiltration test conducted at the base of a test pit indicated that the soil is relatively impermeable, with a vertical hydraulic conductance of 2.5 x 10^{-5} cm/sec. This test, performed on volcanic ash, should be representative of the material underlying Site A. Based on the soil type present, the range of permeabilities could be from 1 x 10^{-3} to 1 x 10^{-8} cm/sec.

3.1.2.3 CCSS Landfill

The area of the CCSS Landfill is covered by up to six feet of deep, loamy soils with some surface gravel beds that are gently to moderately sloping. These materials formed in alluvium on fans and uplands. Topography of the area is gently sloping (2 to 8 percent). Sub-surface soils are glacial tills composed of cobbles, gravel, sand, silt and clay. These soils are typically sandy and well-drained. The sand and gravels are hydrologically very conductive and permeable. Deeper soils and lithologies are more likely to be derived from volcanic deposits, similar to those found at Site A, with more clay content and lower permeabilities.

Soils at the CCSS site are classified into two basic categories: (1) silty loams (ML) which usually comprise the upper 1/2 to 4 feet, and (2) GM soils. To the west-southwest, the gravel disappears and the finer grained, silty material persists. Hydraulic conductance for the CCSS site ranges from 1.0 x 10^{-3} cm/sec for gravel deposits to 1.0 x 10^{-7} cm/sec for the clay deposits. These values are not based on site-specific testing or laboratory analyses from this facility, but estimates based on the soil types present. Due to the lateral and vertical variability of soils at the CCSS site, specific hydraulic conductance data would be needed to more accurately characterize permeabilities.

3.1.3 Regional Geology

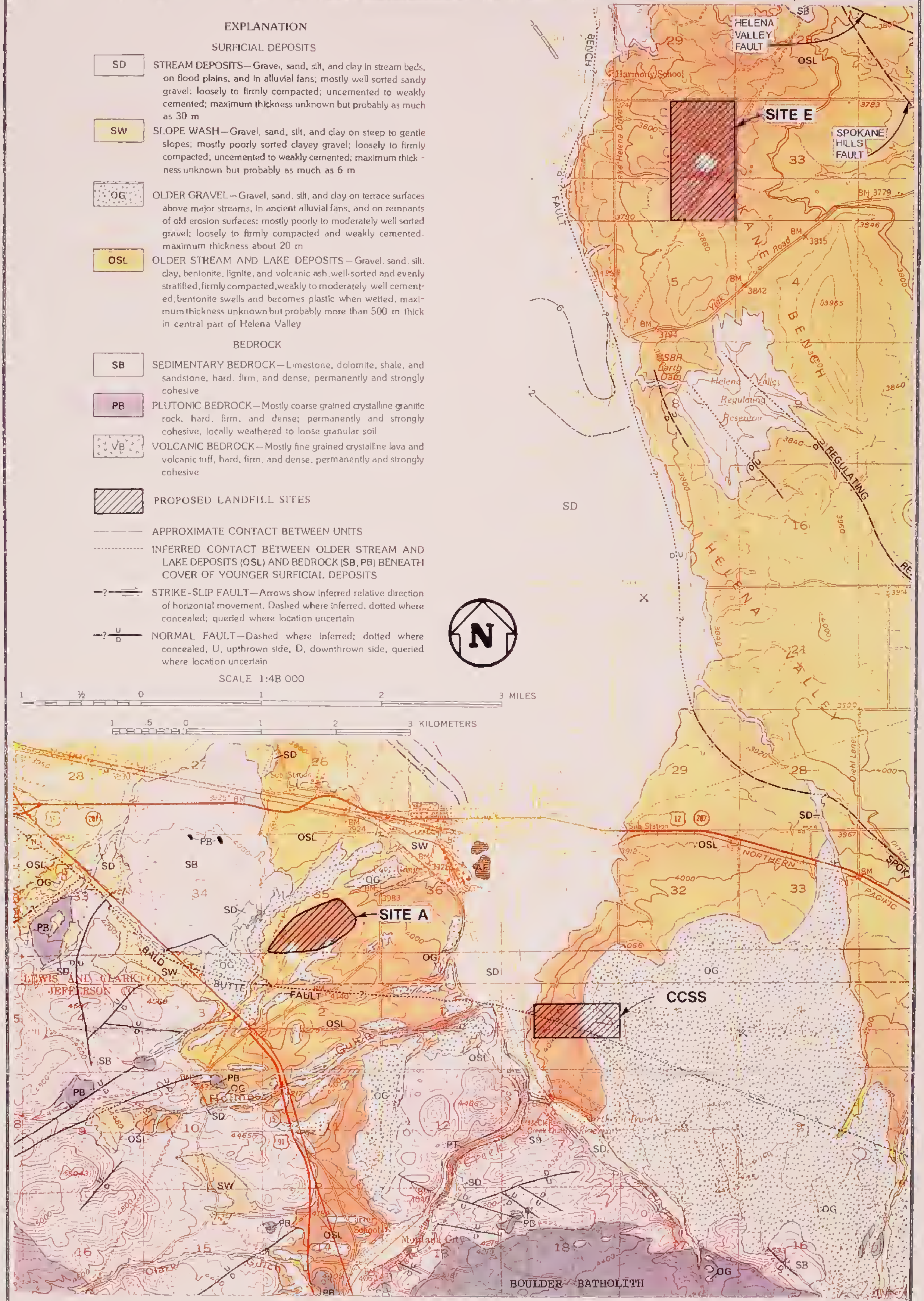
The major physiographic feature of the study area is a broad, northwest-trending, intermontane valley called Prickly Pear or Helena Valley. Figure 3.1-1 is a geologic map showing the major geologic and geographic features of the Helena Valley. Present-day topographic features in the area are a result of the tectonic, erosional, and depositional history of the area. The Helena Valley is surrounded by rocks ranging in age from pre-Cambrian (>650,000 million years old) to Cretaceous (approximately 75 million years old). Folded and faulted sedimentary, metamorphic, and igneous rocks underlie the unconsolidated material and form the hills and mountains surrounding the Valley. The Boulder Batholith, between Helena and Butte, is an intrusion of igneous rock which cooled beneath the land surface. There are numerous known or inferred faults in the study area and the Helena Valley is considered seismically active, or prone to earth movement and earthquakes. This is an important consideration in view of Federal solid waste landfill siting and design criteria, as further discussed in section 4.1.

Mining is an historically and economically significant activity in the Helena Valley. The primary minerals mined in the Helena district are gold, silver, lead, and minor amounts of copper. Smelting and refining have been important industries in this area, including ASARCO's lead smelting facility in East Helena.

3.1.4 Geologic History

The earliest geologic history of the Helena Valley is represented by the thick section of pre-Cambrian limestone and shale beds known as the Belt series. After these sediments were deposited, the area was subjected to deformational stresses which uplifted and faulted the earth's crust. Erosion then reduced the topography to low relief. The Flathead Quartzite of Middle Cambrian age, the bottom or oldest formation of the Paleozoic-era rocks present, was deposited on the truncated beds of the Belt series.

A major break in the geologic record follows, since no rocks are present from the Silurian or Ordovician, the two Periods immediately following (younger than) the Cambrian in the Paleozoic Era. The Jefferson Limestone and the Three Forks Shale of Upper Devonian age, and the approximately 2,600-foot-thick Madison Limestone of the Mississippian Period, were subsequently deposited. Immediately following is the Quadrant Quartzite, a coarse clastic deposit of Pennsylvanian age, which is overlain by a thick section of metamorphosed shale, sandstone, and limestone thought to be Cretaceous in age. These deposits are bounded by the Boulder Batholith, an igneous intrusive of late Cretaceous to early Tertiary age.



EXPLANATION

SURFICIAL DEPOSITS

SD	STREAM DEPOSITS—Gravel, sand, silt, and clay in stream beds, on flood plains, and in alluvial fans; mostly well sorted sandy gravel; loosely to firmly compacted; uncemented to weakly cemented; maximum thickness unknown but probably as much as 30 m
SW	SLOPE WASH—Gravel, sand, silt, and clay on steep to gentle slopes; mostly poorly sorted clayey gravel; loosely to firmly compacted; uncemented to weakly cemented; maximum thickness unknown but probably as much as 6 m
OG	OLDER GRAVEL—Gravel, sand, silt, and clay on terrace surfaces above major streams, in ancient alluvial fans, and on remnants of old erosion surfaces; mostly poorly to moderately well sorted gravel; loosely to firmly compacted and weakly cemented, maximum thickness about 20 m
OSL	OLDER STREAM AND LAKE DEPOSITS—Gravel, sand, silt, clay, bentonite, lignite, and volcanic ash, well-sorted and evenly stratified, firmly compacted, weakly to moderately well cemented; bentonite swells and becomes plastic when wetted, maximum thickness unknown but probably more than 500 m thick in central part of Helena Valley

BEDROCK

SB	SEDIMENTARY BEDROCK—Limestone, dolomite, shale, and sandstone, hard, firm, and dense, permanently and strongly cohesive
PB	PLUTONIC BEDROCK—Mostly coarse grained crystalline granitic rock, hard, firm, and dense; permanently and strongly cohesive, locally weathered to loose granular soil
VB	VOLCANIC BEDROCK—Mostly fine grained crystalline lava and volcanic tuff, hard, firm, and dense, permanently and strongly cohesive
▨	PROPOSED LANDFILL SITES
—	APPROXIMATE CONTACT BETWEEN UNITS
······	INFERRED CONTACT BETWEEN OLDER STREAM AND LAKE DEPOSITS (OSL) AND BEDROCK (SB, PB) BENEATH COVER OF YOUNGER SURFICIAL DEPOSITS
—?—⇄	STRIKE-SLIP FAULT—Arrows show inferred relative direction of horizontal movement. Dashed where inferred, dotted where concealed; queried where location uncertain
—?—U/D	NORMAL FAULT—Dashed where inferred; dotted where concealed, U, upthrown side, D, downthrown side, queried where location uncertain

SCALE 1:48 000

1 ½ 0 1 2 3 MILES

1 .5 0 1 2 3 KILOMETERS

(FROM SCHMIDT, 1986)

Job No. :	23050E
Prepared by :	L.C.
Date :	3/23/93

GEOLOGIC MAP (SURFICIAL DEPOSITS AND BEDROCK) AND FAULT TRACE; HELENA VALLEY, MONTANA

FIG. 3.1–1

Prior to the intrusion of the Boulder Batholith, there was a period of movement in the earth's crust which caused regional, northwest-trending folding and faulting in this area. The Boulder Batholith lies primarily south to southwest of the Helena Valley, but it affected the Valley by metamorphosing sediments. Relatively small, vein-like intrusions of igneous rock (known as "dikes") in the Helena Valley are likely part of, or closely related to, the same magma which generated the Boulder Batholith.

Erosion subsequently reduced the area to a somewhat mature topography, typified by broad river or stream valleys and flat, graded plains. Later, crustal movements during the Tertiary Period warped the sediments and caused faulting. Volcanic activity during this time deposited ash in the intermontane basins, along with sands and gravels derived from erosional activity of wind and water. Folding and faulting, which continued through late Tertiary, shaped the basin sediments and formed the present mountains. Pediments --- slightly inclined, planar surfaces formed on mountain slopes by erosion --- developed along the south, west, and north sides of the valley. This process eroded bedrock along the mountain front, depositing thick wedges of gravels into the valley. Finally, recent streams deposited channel-fill and alluvial-plain sediments of gravel, sand, silt and clay along gently sloping surfaces of the central valley.

3.1.5 Surficial Geology

The Helena Valley is filled with thick accumulations of unconsolidated materials, which consist primarily of fine and coarse-grained sediments derived from the Tertiary, on top of which is approximately 100 feet of similar but younger deposits. The alluvium --- deposits resulting from the activity of rivers and streams --- that covers the surface of the Helena Valley is the result of erosional activity which has occurred since the early part of the Quaternary Period (the Period immediately following the Tertiary). The alluvium consists of broad, gently sloping deposits formed by Prickly Pear and Tenmile Creeks and other streams, and contains rock fragments derived from the streambeds. The deposits are coarse-grained and thick near the topographically higher locations, becoming finer-grained and thinner in the lower parts of the valley.

Surficial deposits present within the Helena Valley fall into nine units: artificial fill, placer tailings, landslide deposits, stream deposits, slope wash, older gravel of Quaternary age, and older stream and older lake deposits of Tertiary age.

3.1.6 Structure, Faults, and Earthquake Hazards

Helena lies on the south side of a large, dome-shaped uplift. The overall structure is a simple anticline, meaning the beds are oppositely inclined and arch upward toward the axis of the structure. However, subsequent to the formation of the dome, granitic rocks of the Boulder Batholith broke through and faulted the south flank of this anticline, and extensive erosion took place. The result is that the Helena Valley is a basin eroded into the uplift, further modified by granitic intrusion and faulting.

The numerous faults in the area result from the granitic intrusion. These faults cut across the sedimentary rocks south and east of Helena and are nearly normal or perpendicular to the direction of trend of the rocks. The fault shear zones are less resistant to erosion, and stream valleys have been cut along the borders of several of them. Faults are primarily located in and adjacent to a linear zone of crustal discontinuity known as the Lewis and Clark line, which trends northwestward through the area and encompasses most of Helena Valley. This line is bounded by the Bald Butte fault to the south and the Helena Valley fault to the north (Figure 3.1-1). Several faults within this line are categorized as potentially active and possible seismic hazards. No active faults (meaning those with observed earth movement) have been recognized. Recall from Chapter 2.0 that, according to EPA Subtitle D regulations, no landfills can be located within 200 feet of a fault that has been active within the last 10,000 years, during the so-called "Holocene age."

Those faults which are in the vicinity of the various alternative landfill sites are the Bald Butte and Helena Valley (strike-slip faults), and Spokane Bench and Regulating Reservoir (normal faults). The estimated ages of these four faults are described in USGS Professional Paper 1316 (Schmidt 1986). Evidence of geologically recent or historic movement along these faults is absent, and topographic features which could indicate surface breakage from earth stresses are lacking. In the vicinity of the proposed landfill sites, these faults are largely covered with soil or concealed by surficial deposits of Holocene and Pleistocene age (0 to 2 million years ago) and by older stream and lake deposits of Tertiary age (2 to 38 million years ago). Based on geologic relations, the main movement of the Bald Butte fault occurred over 38 million years ago. The Helena Valley fault is of similar age. Although the most recent movement occurred between 10,000 and 25 million years ago, the main movement is inferred to have taken place over 38 million years ago. The two normal faults, Spokane Bench and Regulating Reservoir, probably have undergone most of their major movement 10,000 to 2 million years ago (Pleistocene age).

Although the local faults are not known to be active, the Helena Valley is in a seismically active area. Numerous earthquakes have been recorded, including several intense ground movements in 1935. Since settlement of Helena in 1864, several hundred earthquakes have occurred. Most of the shocks have been categorized as weak to moderate, within Intensity range II to IV. However, larger shocks have occurred, including one during the Helena earthquake of 1935 which measured Intensity VII. This earthquake was characterized by a large number of shocks over a three-month period. The largest of these events caused damage to buildings in Helena and East Helena. Most of the damage was a direct result of ground shaking, and the earthquake impacted ground water in numerous wells and increased flow in local springs and creeks. In addition to the 1935 earthquake, several episodes of weak to moderate intensity earthquakes have occurred in 1869, 1910, 1925, 1930, 1940, and 1945. In 1973, there was a series of numerous small earthquakes. The Helena Valley is within Zone 3, the highest risk zone classification of the Uniform Building Code. This designation suggests that seismic activity of Intensity I through IV will likely occur in the future, and a damaging earthquake of Intensity VI or above may occur.

Data presented in USGS Professional Paper 1316 (Schmidt 1986) indicate that the intensity of secondary seismic effects, including ground shaking, is least in bedrock; slightly greater on older stream and lake deposits; intermediate on stream deposits, slope wash, wind-laid deposits, glacial-lake deposits, older gravel and clays; and greatest on artificial till, placer tailings, and landslide deposits. Intensity of these effects may also increase on surficial deposits where the water table is near the ground surface. Therefore, the type of surficial and near-surface materials at a potential landfill site may provide some clue as to the potential for damage during an earthquake, although many other variables including intensity and duration of the seismic event would factor into the relative impact as well.

3.1.7 Site-Specific Geology

A short description of the geology found at each alternative landfill site is provided in the following sections. These descriptions are based on information found in literature regarding the geology of the Helena Valley, as well as site-specific detail obtained during siting studies or land use descriptions. However, the amount of detail does vary between sites, reflecting some inconsistency in the level of investigation applied.

3.1.7.1 Proposed Action - Site E

Tertiary deposits in this part of the Helena Valley are several hundred feet thick. These fine-grained deposits are a combination of volcanic material and weathered bedrock from the surrounding uplands, transported to the valley by erosion and fluvial processes. They contain some sand and gravel lenses of varying thickness and continuity. Generally, the sand and gravel lenses are 2 to 10 feet thick, separated by 20 to 120 feet of clay deposits. The lenses typically occur at depths from 28 to 200 feet below ground level.

Ten test borings (some of which were developed into monitoring wells) and one water supply well were drilled, and 19 test pits were excavated at Site E as part of the site investigations. Material encountered in the borings consisted of Tertiary clay deposits, mainly clayey sand and sandy clay. Material collected or observed in the test pits, which were typically excavated to depths from 9 to 16 feet deep, was primarily sandy clay and clayey sand. In the northwest portion of Site E, sandstone and conglomeratic bedrock were excavated near the surface. These deposits represent older stream and lake deposits, with lesser amounts of bentonite, a sedimentary deposit composed mostly of clay and formed by the alteration of volcanic ash; lignite, a type of sedimentary rock with properties between those of peat and sub-bituminous coal; and volcanic ash.

Faults known or theorized to be in the vicinity of Site E include the Helena Valley Fault to the north, the Spokane Bench Fault to the west and south, and Regulating Reservoir Fault to the southeast. The Helena Valley fault is over 1½ miles north, although the location is inferred due to the surficial deposits presumably covering expression of the fault. The Spokane Bench Fault is inferred to be the closest to Site E, about 1/2 mile west, although its existence in this area is not confirmed. The Spokane Bench Fault is steeply inclined, and displaces older stream and lake deposits along its length. At its midlength, believed to be southwest of Site E, the vertical slip indicated by the upper scarp or cliff of the fault is about 100 feet. There are also sand dikes of unknown age associated with this fault. The Spokane Bench and Regulating Reservoir faults are parallel and probably formed at about the same time. Expressions of this fault zone are absent at Site E, and there is no evidence of seismic activity since late Tertiary to Pleistocene age (10,000 years ago).

Becraft (1958) conducted a survey of radioactive anomalies in geologic outcrops in the Townsend and Helena Valleys. One of the areas surveyed is located just north of Site E, in sections 27, 28, and 29. The outcrops considered are Tertiary conglomerates composed of fragments of volcanic and sedimentary rocks; shales; sandstones; and volcanic tuffs, typically altered to some degree to bentonite, a clay mineral. "Anomalies" of radiation in all of these materials, meaning that the level of radioactivity from naturally occurring minerals was higher than a "normal" background level. The radioactivity in these rocks is believed to originate from uranium minerals which have been leached out of volcanic tuffs and concentrated in the shales or other carbonaceous materials. Becraft described the levels of radiation in the samples from near Site E as slight. The uranium levels represented in the survey paper do not suggest the presence of economically viable mineral deposits.

3.1.7.2 Site A

Eight test pits were excavated on Site A to a maximum depth of 16.5 feet. These pits encountered volcanic ash, reworked ash, and coarse gravel. Logs of five domestic wells located less than one mile south of Site A encountered a thick sequence (>240 feet) of Tertiary volcaniclastic materials, which are essentially volcanic deposits that have been reworked by erosional action. The Site A area is covered with older stream and lake deposits, and pediment gravels from the Middle Pleistocene. Hill tops and ridges in the area are covered with Pleistocene gravel deposits, cobbles, and boulders.

Site A is just north (approximately 1,000 to 2,000 feet) of the inferred trace of the Bald Butte Fault. The Bald Butte is a strike-slip fault, which means that when ground movement occurred it was generally in a horizontal direction, following the trace of the fault. The Bald Butte Fault is covered by surficial deposits, and therefore the exact trace is not known. It is currently thought that movement on this fault pre-dated the older stream and lake deposits, meaning that fault activity was more than 38 million years ago.

3.1.7.3 CCSS Landfill Site

Original contouring of this site has been altered by the CCSS Landfill, an active solid waste disposal facility. The geologic deposits present at CCSS consist of older (Tertiary) stream and lake deposits, and older gravel and alluvium. There are twenty-five test pits, five soil borings (70-foot depth), and six monitoring wells in the area. Subsurface data from the monitor wells indicate up to 45 feet of gravel and cobbles, underlain by silty and clayey gravel, which is in turn underlain by up to 100 feet of weathered volcanic tuff and volcaniclastics. A thick (up to 30 feet) zone of gravel exists near the surface in the northwestern part of the CCSS site. This gravel was encountered in several of the monitoring wells and test pits.

The trace of the Bald Butte Fault is believed to pass almost directly through the CCSS site. The Bald Butte strike-slip fault trends west-east/southeast in this area. Sub-surface control is poor in this area, which means that the exact trace and depth of the fault is not well-defined. The fault trace is covered by surficial deposits in the vicinity of the CCSS area; its location and extent are better defined several miles west of CCSS. There is no evidence of geologically recent movement along the Bald Butte fault. Topographic features indicative of surface breakage or disruption are not visible, and along much of its course the fault appears to be covered by surficial deposits of Holocene and Pleistocene age, and by older stream and lake deposits of middle and late Tertiary age. It is thought that the primary fault movement pre-dated the formation of the older stream and lake deposits, and occurred over 38 million years ago.

3.2 GROUND WATER

This section discusses the regional hydrogeology of the Helena Valley as well as the site-specific hydrogeologic conditions existing at each of the alternative landfill sites. Hydrogeologic information presented here is based on a review of previous investigations which included: test pit excavation, borehole drilling, monitoring well installation and ground water sampling, and aquifer testing. Previous pertinent hydrogeologic investigations which were reviewed have been conducted by Briar and Madison 1992; Damschen & Associates 1990b; Chen-Northern 1990a, 1990b, and 1990c; Hydrometrics 1988; Schaffer & Associates 1992, and Gallagher 1993.

3.2.1 Regional Hydrogeology

The valley-fill aquifer system underlying the Helena Valley is considered the sole source of domestic water supply for about 13,000 residents in the study area (Briar and Madison 1992), and is therefore a resource of considerable importance. The upper few hundred feet of the valley fill has been described as "a sequence of complexly stratified lenses of cobbles, gravel, and sand with abundant intercalated silt and clay." These sediments originate from erosional processes such as river scouring or glacial movement which dislocate materials from higher terrains and deposit them in lower areas. Hence the term valley "fill."

Finer-grained materials such as silts and clays can restrict ground water flow and create separate water-bearing zones with independent hydraulic characteristics. However, the fine-grained layers in the Helena Valley are thought to be discontinuous laterally, thereby allowing interaction with coarse-grained water-bearing zones. Because of this communication among and between the different layers of materials, the Helena Valley ground water is believed to act as one complex aquifer (Briar and Madison 1992).

The Helena Valley aquifer may be characterized by hydraulic properties such as transmissivity, defined simply as the rate at which water passes through an area of given width of the aquifer, and hydraulic conductivity, which may be thought of as the rate of water movement in the aquifer. Estimates of 100 cm^2/sec for the effective transmissivity and 7×10^{-2} cm/sec for the effective horizontal hydraulic conductivity of water yielding zones of the valley-fill aquifer have been made. The numerous clay layers can decrease the composite vertical hydraulic conductivity of the aquifer system by as much as one to three orders of magnitude compared to the horizontal direction. In other words, the vertical (or downward) movement of water can be much slower than horizontal movement due to the presence of fine-grained materials. Abundant water in the shallow parts of the aquifer has generally made deeper drilling unnecessary. As a result, little is known about the hydrogeologic character of the valley fill below a depth of a few hundred feet.

The water system for East Helena is supplied by four wells completed or partially completed in the valley fill, supplemented by a surface water supply. According to existing documentation, East Helena withdraws approximately 70 acre-feet/year combined from these wells. The City of Helena does not have public water supply wells in the valley fill. Most of Helena's water comes from the Missouri River, via the Regulating Reservoir, or Ten-Mile Reservoir. Approximately 13,000 Helena Valley residents are served by private water supply wells located in the valley fill (Briar and Madison 1992).

The following sections provide a description of the hydrogeologic conditions existing at each alternative landfill site. These descriptions are based on information found in the literature regarding the hydrogeology of the Helena Valley, as well as site-specific detail obtained during field investigations. Inconsistencies in the level of investigation conducted at each site are reflected in the amount of detail available for the three sites. As the Proposed Action, Site E has been extensively studied, whereas Site A has little site-specific information.

3.2.2 Site-Specific Hydrogeology

3.2.2.1 Proposed Action - Site E

The description of hydrogeologic conditions at Site E is based primarily on field investigations performed by Chen-Northern. Figures used to locate wells and borings drilled during field investigations are based on the Site E license application, as are reference tables.

Ground water under artesian pressure was encountered in sand and gravel lenses 28 feet below ground surface (bgs) in well E-1D west of the Phase 1 project development area, and at 173 feet bgs in well E-5 near the eastern boundary of the site during drilling of the monitoring well borings (Figure 3.2-1 and Table 3.2-1). Dry sand and gravel lenses above deeper water-bearing sand and gravel were encountered in borings E-2, E-6, E-7, E-8, and E-9. These dry lenses are located at or above the potentiometric surface (the level to which water under pressure would rise due to pressure) in these borings and are either not being recharged or are draining to deeper sand and gravel lenses. Material above and below the water-bearing lenses consists of a relatively impermeable mixture of fine sand and clay which appears to restrict vertical movement of water which has entered the sand and gravel lenses.

A potentiometric surface contour map of the uppermost water-bearing zone encountered beneath Site E (Figure 3.2-2) indicates that ground water flows to the east, south, and west from the northwest corner of the site. One hypothesis for the higher potentiometric elevations in the northwest corner is that this is a recharge area for the confined water-bearing sand and gravel lenses underlying the site. This hypothesis is supported by field evidence of sand and gravel lenses exposed at the ground surface in the northwest corner of the site. As water migrates downward through these lenses, it becomes confined and may be preferentially directed in a southeasterly direction due to the southeasterly dip of the beds. Although the sand and gravel lenses do not appear to be directly connected vertically, some lateral interconnection is likely given the type of environment in which these sediments were deposited. An interconnection between lenses would permit ground water flow from higher (shallower) beds to lower (deeper) beds.

Hydraulic conductivities of the water-bearing sands and gravels were determined by performing slug and bailer-recovery tests in the monitoring wells. Results of these tests indicate that horizontal conductivity values of the water bearing zones range from 8.2×10^{-6} cm/sec to 2.8×10^{-3} cm/sec. Table 3.2-2 summarizes hydraulic conductivity values for the water-bearing zones in the tested monitoring wells.

To determine the approximate yields of the water-bearing zones, the borings for the monitoring wells were blown with compressed air and the quantity of water subsequently produced was measured. Results

TABLE 3.2-1

DEPTH OF SAND AND GRAVEL ZONES, HYDROSTATIC HEADS, AND ESTIMATED YIELDS OF TEST BORINGS - PHASE II HYDROGEOLOGIC INVESTIGATION

Well	Total Depth (feet)	Depths of Dry Sand and Gravel Zones (feet)	Depth of Water Bearing Zones (feet)	Screened Interval (feet)	Approximate SWL (feet)	Hydrostatic Head (feet)	Estimated Yield (GPM)
E-1S	36	None	25-34	Open	13	12	0.5
E-1D	96	None	28-28.5 85-90	80-90	18	67	5.0
E-2	99.5	45-53	88-89 93-94	85-90	63	25	0.5
E-3	83	None	69-75	67-77	19	50	1.0
E-4	91	None	81-90	Open	41	40	0.7
E-5	195	None	173-181	175-185	128	45	1.0
E-6	172	21-40 112-120	150-172	154-164	115	35	1.0
E-7	164	35-39 109-117	150-163	150-160	115	35	2.0
E-8	139	36-41 85-87	128-134	126-136	96	32	1.5
E-9	159	18-25	143-159	145-155	126	17	0.5
Shop-1	209	61-75 85-89	147-157 159-209	147-167 187-207	98	49	9

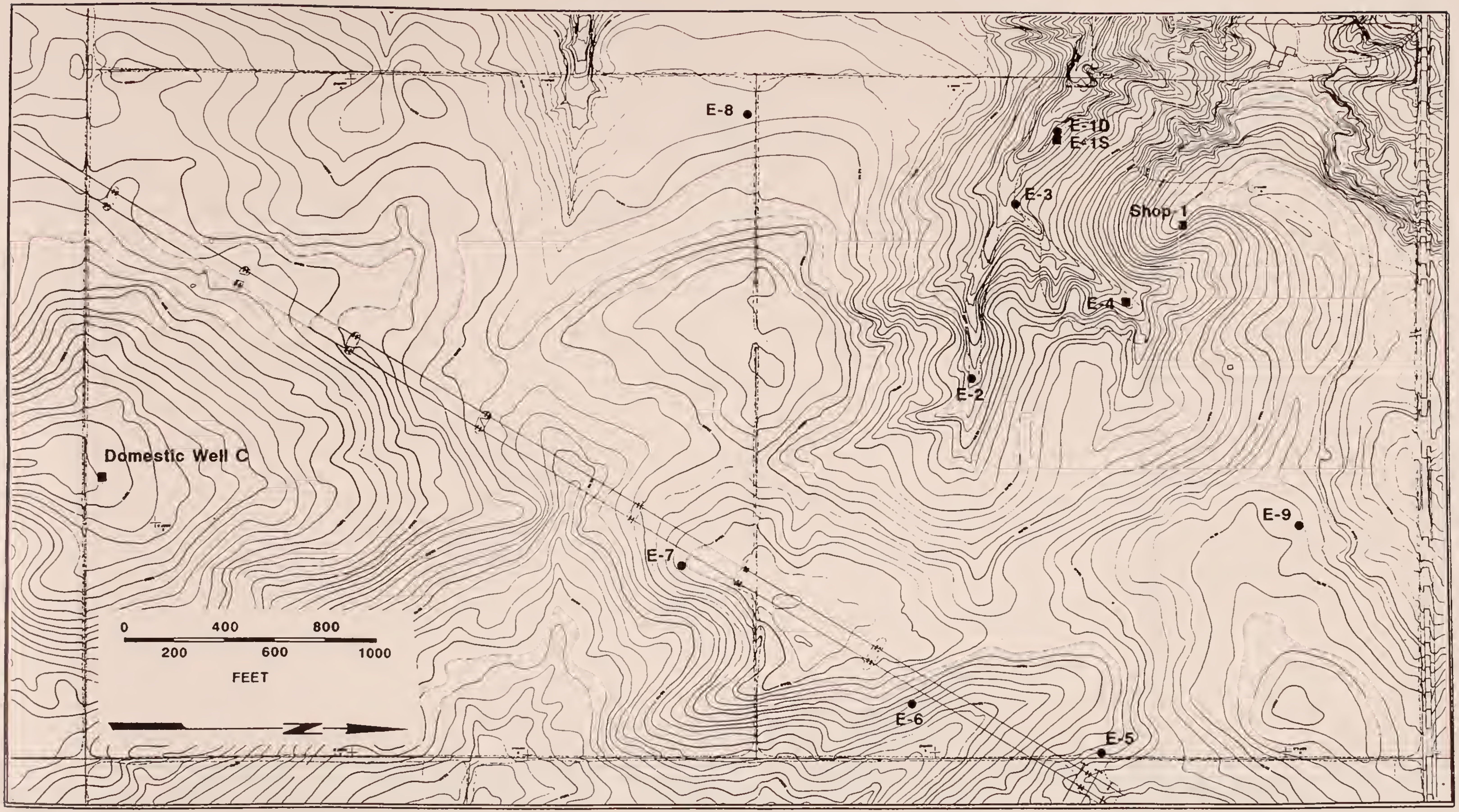
Note: All depths measured from ground surface
Source: Chen-Northern 1990b

TABLE 3.2-2

PERMEABILITY TEST RESULTS - WATER-BEARING ZONES

Boring/ Test Pit	Method	Direction	Material	Hydraulic Conductivity, k (cm/sec)
E-1D	Slug-Cooper	Horizontal	Sand/Gravel, 80' - 90'	3×10^{-4}
E-1D	Slug - Hvorslev	Horizontal	Sand/Gravel, 80' - 90'	1×10^{-4}
E-1D	Bailer Recovery-Cooper	Horizontal	Sand/Gravel, 80' - 90'	4×10^{-4}
E-2	Slug-Cooper	Horizontal	Sand/Gravel, 85' - 90'	3×10^{-4}
E-3	Slug-Cooper	Horizontal	Sand/Gravel, 67' - 77'	6×10^{-5}
E-3	Bailer Recovery-Cooper	Horizontal	Sand/Gravel, 67' - 77'	4.1×10^{-5}
E-6	Slug-Cooper	Horizontal	Sand/Gravel, 154' - 164'	8.2×10^{-5}
E-7	Slug-Cooper	Horizontal	Sand/Gravel, 150' - 160'	2.8×10^{-3}
E-8	Slug-Cooper	Horizontal	Sand/Gravel, 128' - 134'	3.3×10^{-4}
E-9	Slug-Cooper	Horizontal	Sand/Gravel, 143' - 157'	3.3×10^{-4}

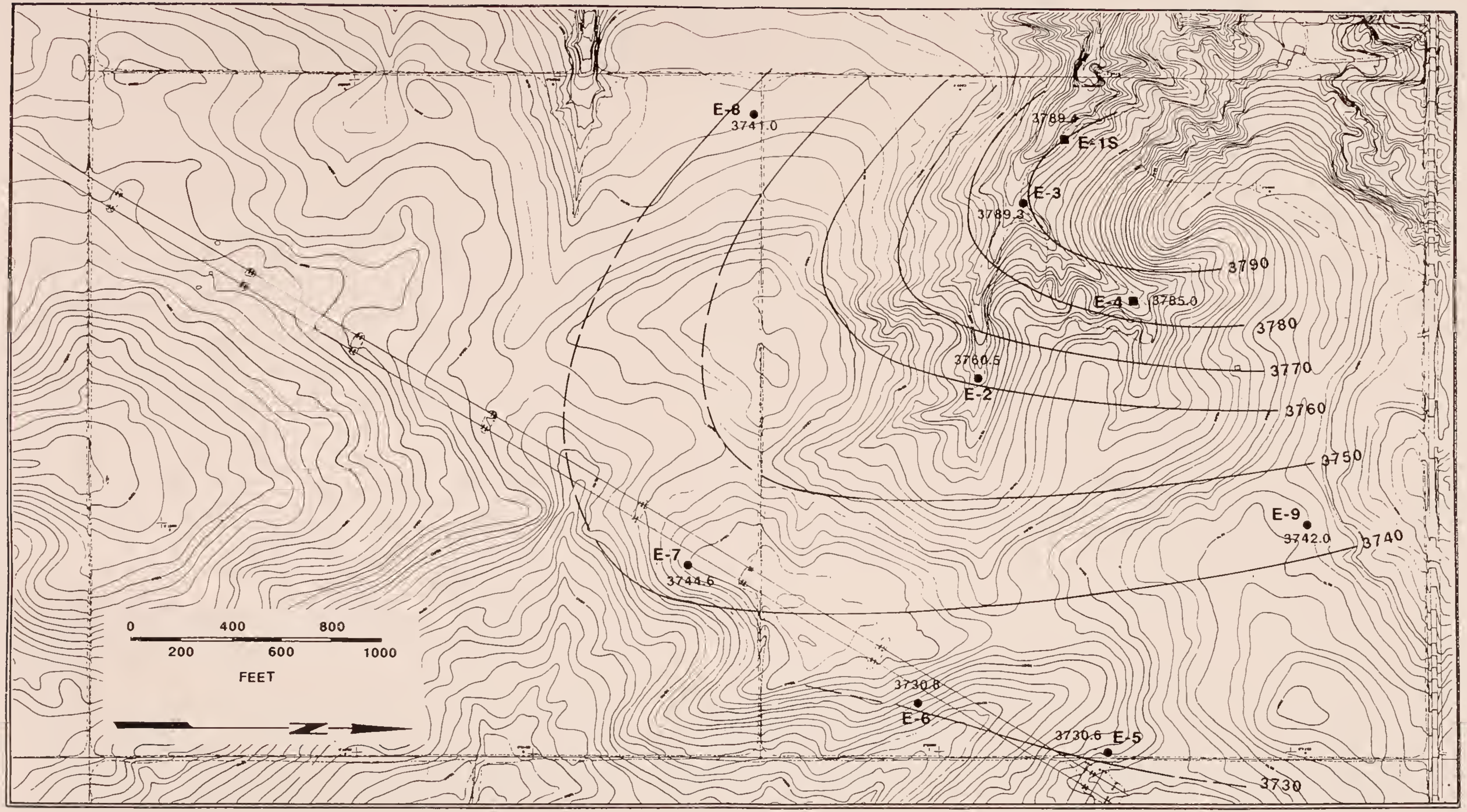
Source: Chen-Northern 1990b



- ● Monitoring Well
- ■ Open Boring

Source: Chen-Northern 1990c

Boring and Monitoring Well Location Map
Site E
FIGURE 3.2-1



- ● Monitoring Well Completed in Uppermost Water-bearing Zone with Static Water Level Elevation (feet)
- ■ Open Boring Terminated After Encountering Uppermost Water-bearing Zone with Static Water Level Elevation (feet)

NOTE:
Static water levels measured on September 14, 1990.

Source: Chen-Northern 1990b

Potentiometric Surface Contour Map,
Uppermost Water-bearing Zone
Site E
FIGURE 3.2-2

of these tests, summarized in Table 3.2-1, indicate yields ranging from 0.5 to 5 gallons per minute (gpm). Well logs from domestic wells in the vicinity of Site E indicate yields of 3 to 30 gpm.

Static water levels in monitoring wells at the site range from approximately 13 to 128 feet bgs. Static water level measurements recorded on domestic well logs in the vicinity of Site E indicate ground water is present at depths ranging from 100 to 150 feet bgs. These domestic wells range in depth from 128 to 740 feet. The nearest domestic wells to Site E are located approximately 400 feet northwest of the site and 1200 feet northeast of the site. Based on the potentiometric surface map in Figure 3.2-2, and referring back to the well locations in Figure 3.2-1, the domestic well approximately 1200 feet northeast may be down-gradient from, or cross-gradient to, Site E. The position of the well northwest of the site with respect to the potentiometric surface is uncertain due to lack of data in this area.

Water quality measurements taken from the monitoring wells indicate on-site specific conductivity values ranging from 691 to 1220 μmhos/cm in the northwest corner of the site to 1280 to 4490 μmhos/cm in the down-gradient wells. The Ph of ground water at the site generally increases from the west to the east side and ranges from 7.1 to 7.8. Ground water temperatures also appear to increase from the west to the east. Temperatures range from 6°C to 13°C in the western half of the site to 13°C to 20°C in the eastern half.

3.2.2.2 Site A

Hydrogeologic information specific to Site A is limited. Data used in the following section is taken from test pit excavations and domestic well logs from the surrounding area, and from a test boring drilled by DHES in support of the EIS evaluations in December 1992.

Wells logs from domestic wells located more than 3,000 feet from Site A indicate that the subsurface material is relatively fine-grained Tertiary volcanic material. Static water levels in these wells range from 60 to 130 feet bgs, with reported yields of 5 to 8 gpm. The nearest domestic well is located approximately 3,000 feet from Site A and appears to be cross-gradient to the probable northward direction of ground water flow. Reports used in this evaluation indicate that ground water at Site A is estimated to occur at depths ranging from 90 to 130 feet bgs. Although it is uncertain how this was determined, it appears that this estimate was made by looking at water levels in domestic wells to the north and south of Site A, and interpolating Site A water levels.

DHES advanced a boring in the approximate center of the proposed Site A area to a total depth of 95.5 feet (Montana DHES 1993). This boring encountered volcanic ash from 1.5 feet bgs to the bottom of the hole. DHES reported encountering thin layers of ash compacted or consolidated to varying degrees at depth intervals 10 to 15 feet, 50 to 58.5 feet, and 78.5 to 93.5 feet bgs. Saturated sediments were encountered at 85.5 feet bgs. The water level in the boring was monitored for more than two hours. DHES noted a linear rise in the water level with time. At the end of the monitoring period, the water level was measured at about 84.5 feet bgs. This level may not represent the potentiometric water surface, since the water level had not stabilized when the last measurement was taken and the hole was plugged, but the field data do suggest an aquifer under confined or pressurized conditions.

A water sample was collected and field tested for Ph (7.56), temperature (41.7°F), and specific conductivity (976 umhos/cm). Laboratory analyses included the above tests as well as assessing concentrations of various elements, total dissolved solids, and nitrate/nitrite. DHES reported that water quality was within the normal range for volcanic ash/tuff aquifer in this area.

A double-ring infiltration test conducted at a depth of 11 feet in the bottom of one of the test pits in the unsaturated zone yielded a vertical hydraulic conductivity value of 2.5×10^{-5} cm/sec. The material tested was a volcanic ash which is likely representative of the material underlying the site at shallow depths.

Site A is located in an area where a downward vertical hydraulic gradient exists. Known as a recharge area, this gradient implies the ground water system may be recharged from surface water flow and precipitation. A well pair located on the west side of East Helena had a reported downward vertical hydraulic gradient of 0.0245 ft/ft. If the vertical permeability of the valley fill is sufficient (i.e., the valley fill has the capability to allow water to move downward), the vertical flow of water under this gradient could be significant.

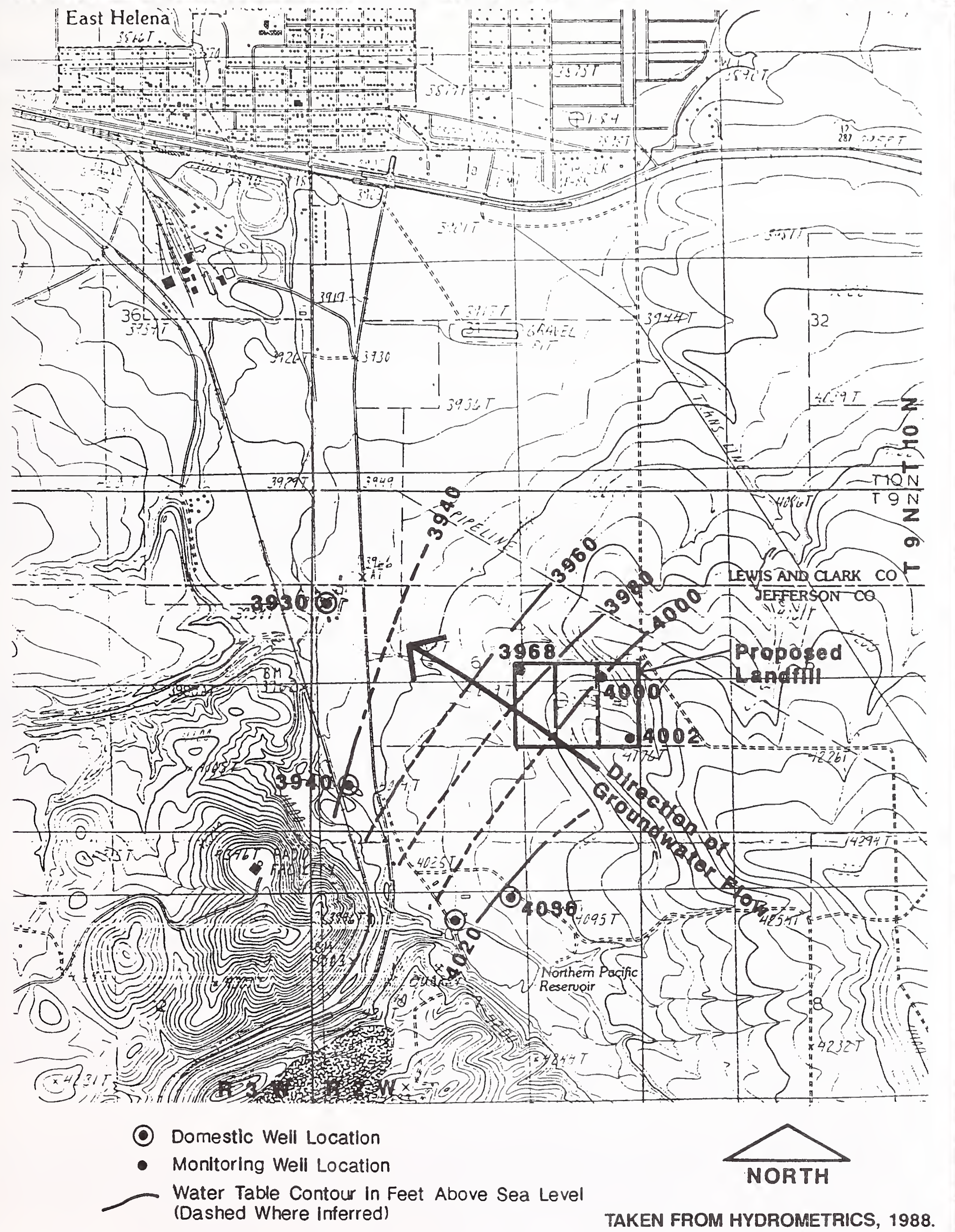
Much of the above discussion is based on a regional assessment of ground water recharge and discharge areas in the Helena Valley (Briar and Madison 1992). Site-specific conditions will dictate whether a certain location conforms to the regional picture. For example, the presence of a laterally extensive clay layer below an area such as Site A could greatly decrease the vertical hydraulic connection and prevent the downward movement of water, even in the area which supplies recharge to the Valley. Data on Site A are relatively limited to make a determination regarding the potential for vertical ground water flow. However, DHES has concluded that the subsoil/sub-surface sediments and hydrogeologic conditions observed at Site A conform to the local and regional geologic and hydrologic conditions described in the literature.

3.2.2.3 CCSS Landfill

Hydrogeologic information for CCSS Landfill is taken from field investigations performed by Hydrometrics (1988), Schaffer & Associates (1992), and Gallagher (1993).

Six monitoring wells currently exist at the CCSS Landfill. Wells MW-1, MW-2, MW-3, MW-5, MW-6 are completed in the baked and hardened (termed "indurated") tuff of the Tertiary deposits at depths from 130 feet bgs to 260 feet bgs. Well MW-4 is completed in dry, shallow gravels of Quaternary or Tertiary age at a depth of 30 feet bgs. Well logs indicate that the tuff forms the uppermost aquifer at the site, while the extensive overlying shallow gravel beds appear dry. A perched water bearing zone was discovered at 62 feet bgs on the eastern edge of the site in the 1993 drilling (Gallagher, 1993). Numerous layers of clays and silts overlay the water-producing zone. As a result, the indurated tuff aquifer displays confined conditions with pressure heads of 30 to 60 feet.

Based on water levels from the monitoring wells and from domestic wells located in the vicinity of the landfill, ground water flow is believed to be to the northwest across the site (Figure 3.2-3). Historical water level measurements from the five monitoring wells indicate static water levels of approximately 70



TAKEN FROM HYDROMETRICS, 1988.

Job No. : 23050	GROUNDWATER POTENTIOMETRIC SURFACE CONTOUR MAP CCSS LANDFILL
Prepared by : A.C.F.	
Date : 3/23/93	

FIG. 3.2-3

feet bgs to 180 feet bgs across the site. Seasonal fluctuations generally appear to be less than about two feet.

Site-specific water quality data indicate that ground water quality deteriorates in a down-gradient direction moving from MW-1 to MW-2 to MW-3. MW-1 contains relatively low levels of major cations and anions and an estimated total dissolved solids (TDS) value of 458 mg/l. MW-3 contains water of poor quality, with TDS values of over 1500 mg/l, sulfate over four times the recommended secondary drinking water standard of 250 mg/l, and relatively high nitrate. The water quality from well MW-2 is intermediate between MW-1 and MW-3.

The CCSS Landfill is also within the general recharge area for the Helena Valley regional ground water system (Briar and Madison 1992). The discussion in section 3.2.3 regarding site-specific recharge conditions and connection with the regional aquifer is applicable here as well, although more information is available regarding the CCSS site. Specifically, well logs for the CCSS Landfill indicate the presence of a thick sequence of silts and clays with gravels overlying the indurated tuff. However, these well logs do not indicate whether the stratigraphy of this sequence is such that vertical ground water flow is diminished.

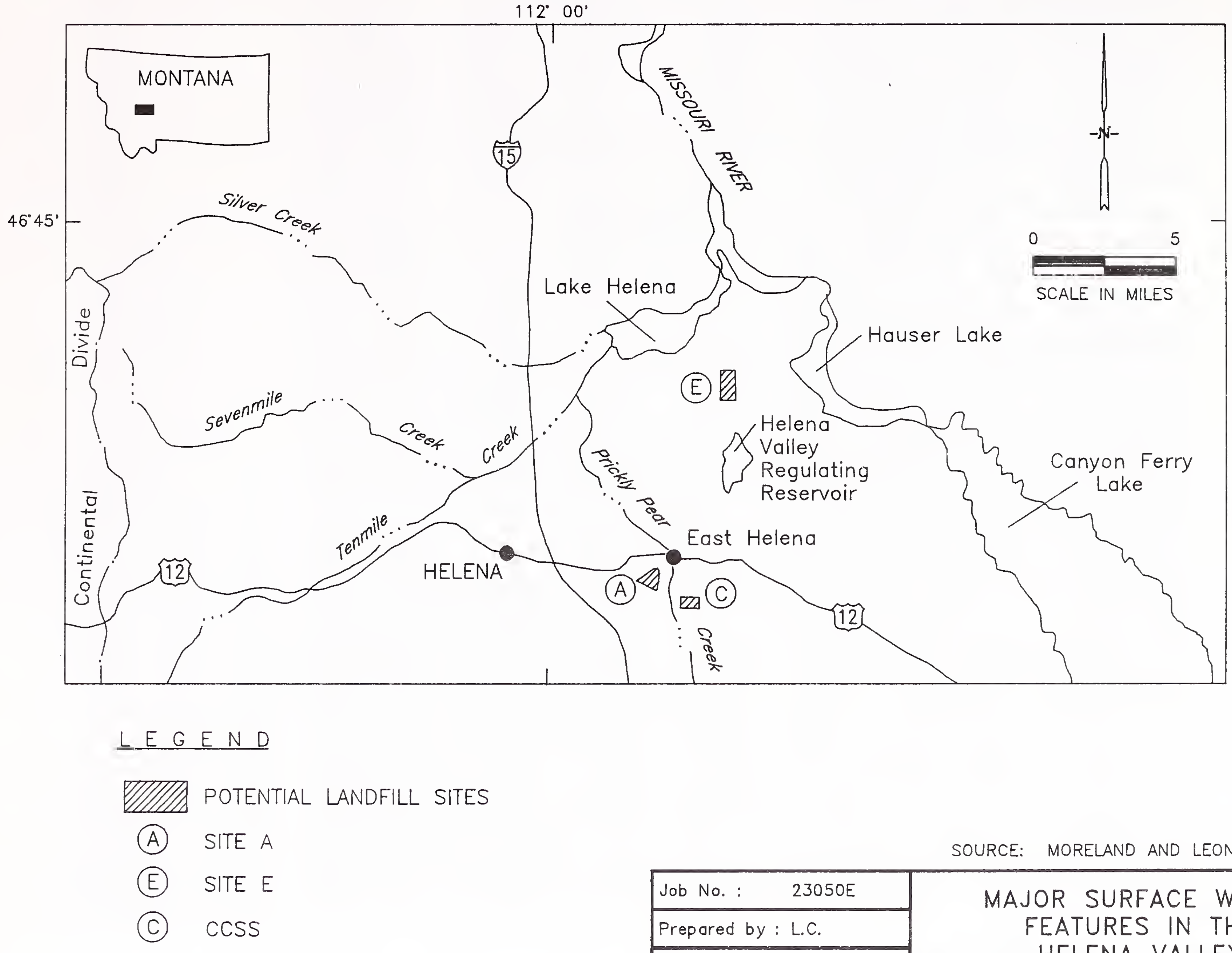
3.3 SURFACE WATER

Sources providing information about surface water resources in the study area include several reports by the U.S. Geological Survey, a remedial investigation and feasibility study for ASARCO's smelter in East Helena, and siting studies and hydrogeologic investigations conducted for the Lewis & Clark County Landfill. References used in this section are Briar and Madison 1992; Lorenz and Swenson 1951; Moreland and Leonard 1980; and the Remedial Investigation/Feasibility Study prepared for ASARCO, Inc. by Hydrometrics 1990.

3.3.1 Surface Water in the Study Area

The Helena Valley is part of the Missouri River basin. Several major reservoirs, including Canyon Ferry Lake and Hauser Lake, are located in the northern part of the valley. The Helena Valley has a semiarid climate, with an average annual precipitation of 11 to 12 inches per year (NOAA 1982). Precipitation at high altitudes in the mountains adjacent to the valley may exceed 30 inches per year, providing surface runoff into drainage systems and a source of recharge to the ground water system. Streams which cross the valley lose significant quantities of water to the subsurface. Deep percolation of irrigation water in the valley, as well as leakage from irrigation canals, provides significant recharge to the ground water during the irrigation season.

Figure 3.3-1 shows the major reservoirs, lakes and creeks within the Helena Valley. The mountain slopes to the west, southwest and south of the Helena Valley are drained by streams which empty into Lake Helena, which is located in the valley north of Helena. Lake Helena is formed by the backwater from Hauser Lake on the Missouri River. It has the lowest altitude of the Helena Valley at 3,650 feet, and is the principal discharge point for surface and ground water from the entire basin.



SOURCE: MORELAND AND LEONARD 1980

Job No. :	23050E
Prepared by :	L.C.
Date :	3/23/93

MAJOR SURFACE WATER
FEATURES IN THE
HELENA VALLEY

FIG. 3.3–1

The four major streams which flow into the valley are Prickly Pear, Tenmile, Sevenmile, and Silver Creeks. The largest of these streams is Prickly Pear Creek, with its tributary McClellan Creek. Together, these two creeks drain about 241 square miles of the Boulder Batholith and Elkhorn Mountains to the south. Both creeks flow northward into the Helena Valley. Based on 54 years of record, the mean annual flow rate for Prickly Pear Creek is 48,000 acre-feet. Tenmile Creek drains the southwestern portion of the valley and has a total drainage area of about 98 square miles, with a mean flow rate of 18,600 acre-feet/year, based on 75 years of record. Sevenmile Creek joins Tenmile Creek northwest of Helena, and Silver Creek drains the western slopes of the valley and flows directly into Lake Helena. Prickly Pear Creek flows relatively near the alternative landfill sites. It splits into several distributaries in the valley near East Helena, with the principal distributary flowing northwest, where it intersects Tenmile Creek about one mile southwest of Lake Helena. Water in the other distributaries of Prickly Pear Creek is used for irrigation between Helena and East Helena. Although water quality data for Missouri River tributaries in the Helena Valley is somewhat sparse, information for Prickly Pear Creek is available, primarily from the 1990 RI/FS on the ASARCO smelter site.

Intermittent stream flow in low areas south of Helena and ephemeral runoff from hillsides adjacent to the valley fill also supply surface water to the valley. Intermittent stream flow in these gulches is collected by infiltration galleries and pumped to tank reservoirs of the Helena water-supply system. Ephemeral runoff supplies only minimal flow, primarily during periods of high rainfall.

In the mountain slopes south and east of Helena, springs supplied by fractures in the rocks add perennial flow to some of the smaller streams, and provide stock and domestic water. Municipal water supplies for Helena and East Helena include these spring-fed streams. A portion of Missouri River water is diverted to the Helena Valley Regulating Reservoir for use in irrigation or as municipal water supply by further pumping to the treatment plant. Irrigation water is released to a series of irrigation canals, and subsequently distributed to the central valley. These irrigation canals distribute water to a large percentage of the central valley.

Overall, surface water quality in the Helena Valley is good, with low TDS, low metals concentrations, and near neutral pH. Surface waters are typically of a calcium carbonate type, composed primarily of calcium, bicarbonate, and sulfate. Seasonal variations occur in surface waters throughout the valley, with proportionally higher levels of TDS during periods of low flow. Sediment loading within surface drainages also varies seasonally.

3.3.2 Site-Specific Surface Water Resources

3.3.2.1 Proposed Action - Site E

Site E lies on a topographic divide which separates Hauser Lake, located about two miles to east of Site E, from Lake Helena, approximately two miles to the northwest. The Helena Valley Regulating Reservoir is just over one mile south of Site E.

Although there are no major creeks located within Site E, there are several minor draws which may transport surface water flow during high rainfall events or spring snow melt. Draws located in the east drain toward Hauser Lake, and draws located in the west to northwest drain toward Lake Helena. Minor drainages in this area typically are bedded with relatively impermeable sediments which reduce surface capacity for water infiltration to the subsurface. This feature maximizes overland flow during high water events.

No perennial streams flow within the boundaries of Site E. There are several ephemeral (those which flow only part of the year) streams west of Site E, and one ephemeral stream crosses into the northwestern portion of Site E. There are irrigation canals and numerous irrigated fields near Site E, as well as small ponds with associated marshy areas. East of Site E approximately one half to one quarter mile a irrigation canal flows south to north. East of the canal a series of seeps and springs are found in a drainage of an unnamed intermittent stream according to the U.S. Geological Survey topographic map of the area (USGS 1972a). Locally this stream is called Cedar Creek. Some local sources contend that a few of these springs flow with sufficient volumes year around to provide perennial water flows in portions of Cedar Creek. Sand and gravel lenses within the clays can provide an avenue for migration of irrigation water into the ponds and marshes. Site E lies outside the 100-year floodplain of any perennial drainage system.

No surface water quality data are available from within Site E because there are no perennial streams on the property. However, data from irrigation water and springs less than 2 miles east of Site E indicate that surface water quality is relatively good. Specific conductance of irrigation water range from 344 to 395 μmhos/cm, and from nearby springs range from 500 to 1,000 μmhos/cm at 25^0 C. Irrigation canals and spring water yielded pH values ranging from 7.0 to 8.2.

Flows in irrigation canals and from springs were documented during the baseline environmental investigations for the Site E license application (Chen-Northern 1990a). Most springs were estimated at that time to flow at less than 10 gpm, but these values may be representative of a dry time of year or a season with low recharge. For instance, spring S-3, located approximately 1½ miles east of Site E, was estimated in the Chen-Northern report to be flowing at 5 to 10 gpm. However, observation of this spring by local residents, Woodward-Clay personnel, and DHES staff have indicated it was flowing at levels above 50 gpm at different times of the year (Classen 1992). This order of magnitude difference in flows may illustrate a highly varying water table and flow conditions, or at least a strong connection between recent water recharge conditions and near-surface ground water flow.

3.3.2.2 Site A

There are no perennial surface water sources within or adjacent to Site A. Most of the site lies on an elevated terrace, with minor draws which drain away from the center of the site. Surface water flow would likely occur only as short duration events during spring snow melt and high rainfall events. Surface water runoff from Site A which does not infiltrate to the ground water would discharge to Prickly Pear Creek to the northeast.

3.3.2.3 CCSS Landfill

The only surface water sources within the CCSS site are ephemeral drainages and minor draws. Prickly Pear Creek enters the southwestern portion of the Helena valley southwest of the CCSS site and flows in a northerly direction. At its nearest point this drainage is less than one-half mile west of the CCSS site. Prickly Pear Creek continues its northward path toward the ASARCO Smelter, then trends in a northwest direction until it meets Tenmile Creek near Lake Helena.

Surface water flow on the CCSS site would likely occur only as short duration events during spring snow melt and high rainfall events. Because there is no liner in the landfill cells currently being used at CCSS, and also limited control of surface water flow, it is likely that some surface water runoff enters the open cells, percolates through solid waste and into the subsurface. Surface water runoff from CCSS which does not infiltrate to the ground water would discharge to Prickly Pear Creek to the west/northwest, since there are presently limited surface water controls at this facility to prevent runoff from leaving the licensed area.

3.4 CLIMATOLOGY, METEOROLOGY AND AIR QUALITY

The climate and general meteorological conditions prevailing in the study area are similar, if not the same, for the alternative landfill sites. Air quality is similar, but can vary based on local conditions and such factors as roads, industrial sources, and wood burning. Because of the similarity in conditions, the discussions in this section are not site-specific, but applicable to the entire study area.

3.4.1 Climatology and Meteorology

All of the alternative sites for the Lewis & Clark Sanitary Landfill are located in a mountain valley bounded on the west and south by the continental divide. Surrounding mountains average 3,000 feet higher elevation than the valley floor. The climate can be described as modified continental, with Pacific Ocean air masses, drainage of cool air from the mountains, and the protection of the surrounding mountains having an influence on the local climate. In winter, the mountains may act to deflect cold arctic air to the east and also to prevent warming in the valley after periods of extreme cold . Strong thermal inversions are common during periods of transition from cold to warmer air masses.

Temperatures range from moderate in the summer to occasional periods of extreme cold in the winter. Maximum summertime temperatures are generally less than 90°F with a maximum recorded temperature of 105°F occurring in August 1969. Winter time temperatures can drop below zero with a low of -42°F, recorded in January 1957. The annual average temperature is 43.7°F. Average monthly temperatures are presented in Table 3.4-1.

The annual average precipitation amount is 12.2 inches with the majority falling in the late spring and early summer from showers and thunderstorms. June is the wettest month of the year, receiving an average 2.18 inches, while February, with 0.52 inches, is the driest. The annual average snowfall is

TABLE 3.4-1

AVERAGE, MONTHLY, MINIMUM, MAXIMUM, AND MEAN TEMPERATURES

Month	Temperature (Deg F)		
	Minimum	Maximum	Mean
January	10.7	28.7	19.7
February	15.1	34.0	24.6
March	22.5	42.6	32.5
April	32.1	54.9	43.5
May	40.5	63.9	52.2
June	47.9	72.1	60.0
July	53.6	82.1	67.8
August	52.1	80.5	66.3
September	42.8	68.5	55.7
October	33.9	56.9	45.4
November	22.8	41.8	32.3
December	15.3	32.6	23.9
Annual	32.5	54.9	43.7

Period: 1959-1988
Source: National Oceanic and Atmospheric Agency (NOAA) 1988

47.0 inches with the majority falling in December and January. Monthly and annual precipitation and snowfall amounts are summarized in Tables 3.4-2 and 3.4-3.

High winds can occur at anytime during the year, but do not generally last more than a few hours. Winds are generally from the west with an annual average wind speed of 7.8 mph. Figure 3.4-1 presents a wind rose from the meteorological monitoring station at the Helena Airport which charts wind direction and speeds.

3.4.2 Air Quality

Air quality in the Helena area is generally considered to be good and in compliance with regulatory standards (in "attainment") for all criteria pollutants, with the following exceptions:

- A four-mile square area centered around the East Helena ASARCO Smelter is not in attainment for lead.

- A one-mile radius around the East Helena ASARCO Smelter is not in attainment for sulfur dioxide.

Air quality is monitored at various locations in Helena and East Helena in a network directed by the DHES Air Quality Bureau (AQB). The locations of the monitoring stations and the data collected are believed to be a conservative representation of the baseline air quality at the different proposed project locations. The parameters monitored include lead, total suspended particulates (TSP), particulate matter less than 10 microns in aerodynamic diameter (PM_{10}), and sulfur dioxide (SO_2). Table 3.4-4 presents ambient air quality concentrations measured at these stations. This data, collected during 1991, generally present the highest concentrations measured by the network for each pollutant. For comparative purposes, the federal and state ambient air quality standards are presented in Table 3.4-5.

3.5 NOISE

The alternative sites for the Lewis & Clark County Landfill are located in rural areas. Baseline ambient noise levels are expected to result from activities normally occurring in these types of locations. Noise levels for the alternative sites were not collected but estimated based on a correlation between population density/land use and noise levels developed by the National Academy of Sciences (U.S. Department of Commerce 1977). This estimation method is valid for use in areas that are not in the vicinity of especially noisy existing sources such as busy airports, freeways, railroads or railroad switching yards. The correlation between population density and ambient noise levels is presented in Table 3.5-1.

Noise levels are presented in terms of decibels in the A-weighted scale (dBA). The A-weighting network was designed to simulate human hearing. For example, the human ear does not perceive sounds at low frequencies in the same manner as those of equal intensity at higher frequencies. The A-weighted network de-emphasizes lower frequency sounds to simulate the response of the human ear.

TABLE 3.4-2

AVERAGE MONTHLY PRECIPITATION

Month	Precipitation (in)
January	0.70
February	0.52
March	0.73
April	0.98
May	1.90
June	2.18
July	1.11
August	0.92
September	1.16
October	0.75
November	0.62
December	0.63
Annual	12.20

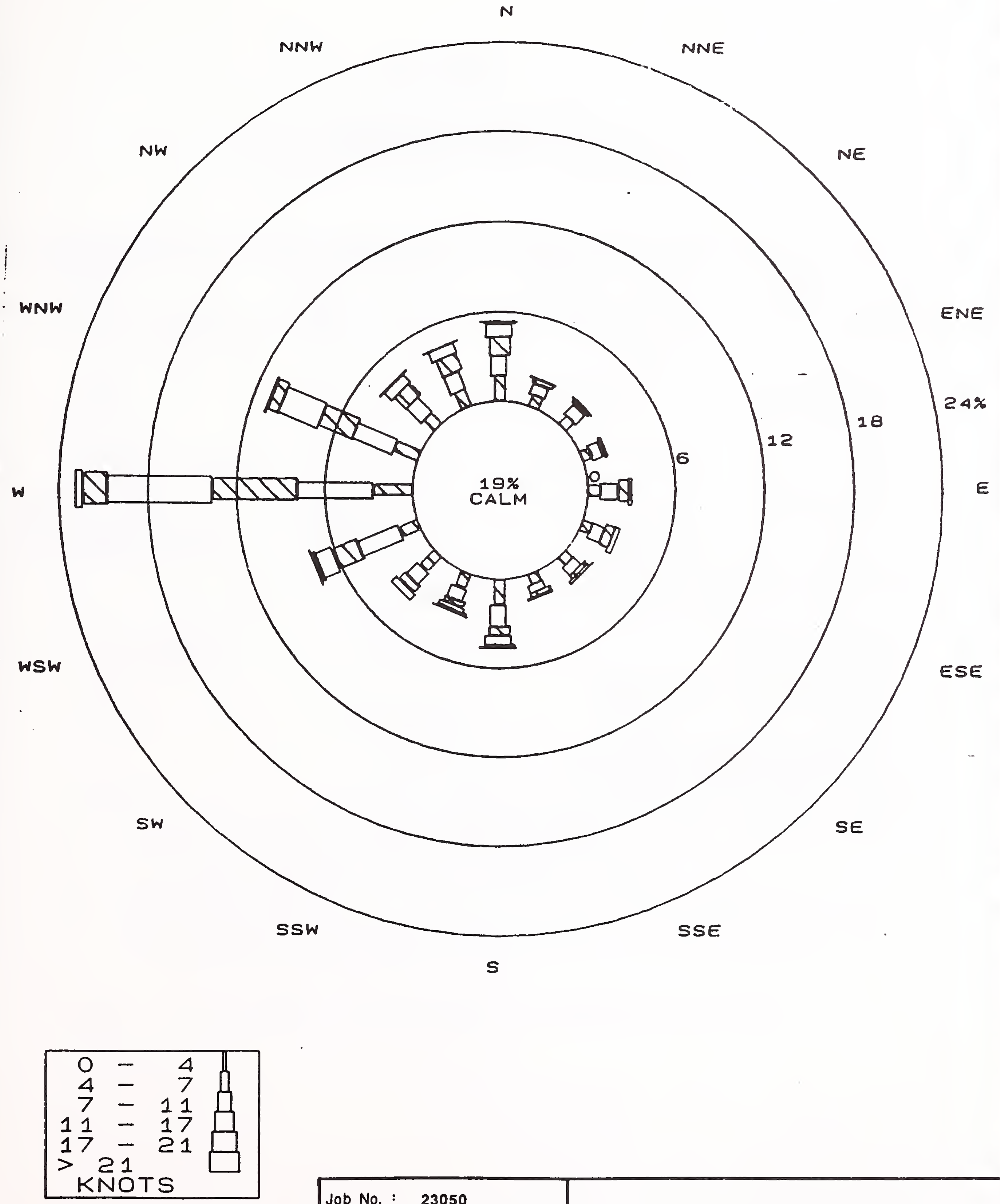
Period: 1959-1988
Source: NOAA 1988

TABLE 3.4-3

AVERAGE MONTHLY SNOWFALL

Month	Snowfall (in.)
January	8.6
February	6.1
March	7.2
April	4.9
May	1.5
June	0.1
July	Trace
August	0.0
September	1.7
October	2.1
November	6.5
December	8.4
Annual	47.0

Period: 1959-1988
Source: NOAA 1988



Job No. :	23050
Prepared by :	M.W.S.
Date :	1/15/93

1984 ANNUAL WINDROSE
HELENA AIRPORT

FIG. 3.4-1

TABLE 3.4-4

1991 AMBIENT AIR QUALITY EIS STUDY AREA

Pollutant	Monitoring Location	Averaging Period	Concentration $\mu g/m^3$
PM_{10}	Cogswell Building^H	24-hour	88
		Annual$^{(1)}$	17
Total Suspended Particulate	Old Railroad^{EH}	24-hour	262
		Annual$^{(2)}$	26
Lead	Firehall^{EH}	Quarterly	3.64$^{(3)}$
Sulfur Dioxide	Water Tank^{EH}	3-hour	1065 (0.41 ppm)
		24-hour	152 (0.058 ppm)
		Annual	15 (0.0057 ppm)

PM_{10} - Particulate matter less than 10 microns in diameter

(1) Arithmetic Mean
(2) Geometric Mean
(3) Occurred during 3rd quarter 1991

^{H} Monitoring location in Helena
^{EH} Monitoring location in East Helena

Source: U.S. Environmental Protection Agency 1992

TABLE 3.4-5

STATE OF MONTANA AND FEDERAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Period	Montana Standard $\mu g/m^3$ (ppm)	Federal Standard $\mu g/m^3$ (ppm)
Carbon Monoxide	1-hour(1)	26,450 (23)	40,000 (35)
	8-hour(1)	10,350 (9)	10,350 (9)
Ozone	1-hour(1)	196 (0.1)	235 (0.12)
Nitrogen Dioxide	1-hour(1)	564 (0.3)	--
	Annual(2)	94 (0.05)	94 (0.05)
Sulfur Dioxide	3-hour(3)	1310 (0.5)	1310 (0.5)
	24-hour(1)	262 (0.1)	365 (0.14)
	Annual(2)	52 (0.02)	80 (0.03)
Total Suspended Particulates(4)	24-hour Primary(1)		260 (--)
	Annual		75 (--)
PM_{10}	24-hour Primary(1)	150 (--)	150 (--)
	Annual(2)	50 (--)	50 (--)
Lead	Quarterly(2)	1.5 (--)	1.5 (--)

(1) Not to be exceeded more than once per year

(2) Not to be exceeded more than 18 times in 12 months

(3) Not to be exceeded

(4) Standards for TSP have been superseded by PM_{10}; included here for informational purposes only

Source: Montana Dept. of Health and Environmental Services (1990)

TABLE 3.5-1

TYPICAL AVERAGE DAY-NIGHT SOUND LEVELS FOR VARIOUS POPULATION DENSITIES[1]

Description	Population Density (people/mi^2)	Noise Level L_{dn} - dBA
Rural (undeveloped)	20	35
Rural (partially developed)	60	40
Quiet Suburban	200	45
Normal Suburban	600	50
Urban	2,000	55
Noisy Urban	6,000	60
Very Noisy Urban	20,000	65

[1] For areas where there is no well defined noise sources other than transportation noise.

Source: U.S. Department of Commerce (1977)

The baseline noise levels from Table 3.5-1 are daytime and nighttime equivalent sound levels (L_{dn}) in dBA. The L_{dn} is a measurement of the equivalent sound level with a 10 decibel weighting applied to the nighttime hours of 10 p.m. to 7 a.m. A 10-decibel weighting is applied because noise levels are perceived to be higher and more annoying during nighttime hours.

Site-specific ambient noise levels for each of the alternatives are presented below.

3.5.1 Proposed Action - Site E

As described above, Site E is located in a rural area. The typical ambient noise levels associated with this type of land use from Table 3.5-1 are 35 to 40 dBA.

3.5.2 Site A

Site A is located in a rural area and the resulting ambient noise level from Table 3.5-1 is estimated to be 40 dBA.

3.5.3 CCSS Site

The CCSS site is an active sanitary landfill. A crawler-tractor equipped with a front-end loader is used throughout the day to compact and cover refuse. Data from the Construction Engineering Research Laboratory (1978) indicate noise levels of 83 to 89 dBA at a distance of 15 meters for this type of equipment. The resultant baseline ambient noise level at the CCSS site is 89 dBA.

3.6 WILDLIFE

Numerous wildlife species have traditionally used the Helena Valley for partial or year-round habitation. The Valley's location along the Missouri River provides a natural migration corridor and low-land habitat to a variety of wildlife species. Land use changes have limited the distribution and use for many of these species, while others have adapted their use and habits to the changing conditions. Some species have increased in number with these changes. Generally, wildlife distribution at the alternative landfill sites will be similar. Reports and references used in the description of the wildlife environment include the Montana Natural Heritage Program (1992), Thompson (1982), and Chaffee (1990), personal contacts with Montana Department of Fish, Wildlife and Parks biologists, as well as limited observations of wildlife at the alternative landfill sites made during EIS preparation.

3.6.1 Terrestrial Wildlife

Terrestrial wildlife can be classified into game and non-game species. Current management trends revolve around providing limited consumptive uses (hunting, trapping) of several game species, as well as expanding the development of nonconsumptive use. For instance, wildlife viewing has become an active recreational activity for many people. Key terrestrial species include white-tail deer, mule deer, elk, pronghorn antelope, beaver, muskrat, mink, weasels, coyote, red fox and striped skunk. Thompson (1982) compiled a list of wildlife distribution throughout the state. Amphibians, reptiles and mammals existing in Montana that may occur or are known to occur in the Helena Valley are presented in Table 3.6-1.

3.6.2 Avian

The Helena Valley supports a wide diversity of bird species. Raptors, waterfowl, upland game birds, scavenger birds, and seasonal migrants are all important classes of fauna. Key raptors inhabitating the area include the bald eagle, peregrine falcon, osprey, golden eagle, Swainson's hawk, red-tailed hawk, marsh hawk, and the American kestrel. Species of owls are also common. Important waterfowl species include Canada geese, mallard, pintail, gadwall, widgeon and teal. Upland game birds include the Hungarian (gray) partridge, ring-necked pheasant, and grouse. Several scavenger bird species frequent the area, including gulls, crows, ravens, magpies, and jays. Seasonal migrants having significant local importance include the sandhill crane, great blue heron, common loon, and trumpeter swan. The occurrence of bird species has been documented by the Helena Audubon Society. Table 3.6-2 presents a list of birds found in the Helena area.

3.6.3 Aquatic

The Missouri River bounds the east side of the study area. Hauser Reservoir, Lake Helena, and Regulating Reservoir are all located within the boundary of the study area. A number of streams in the area feed into the Missouri River, or the lakes and reservoirs near it, including Prickly Pear and Tenmile Creeks. An extensive network of irrigation canals and ditches interconnect these areas. Several intermittent streams and dry washes drain into this system.

Native and introduced trout inhabit the aquatic environment of the cooler waters. The trout are important species to the recreational industry, but a large variety and number of other aquatic species are also present in the Helena Valley surface water system. The Montana Department of Fish, Wildlife, and Parks monitors species occurrence. Table 3.6-3 presents a listing of fishes found in or near the Helena Valley.

3.6.4 Threatened, Endangered and Sensitive Species

Wildlife species of special concern include those listed as endangered or threatened by the USFWS, those under review for endangered and threatened status, and species considered imperiled or critically imperiled, by the Montana Natural Heritage Program. Two federally listed endangered species, the bald eagle (Haliaetus leucocephalus) and the peregrine falcon (Falco pereginus), are known to inhabit the nearby Missouri river drainage. No other species listed as critically imperiled inhabit the study area.

TABLE 3.6-1

MONTANA AMPHIBIANS, REPTILES, AND MAMMALS THAT MAY OCCUR OR ARE KNOWN TO OCCUR IN THE STUDY AREA[1]

AMPHIBIANS	OCCURRENCE DOCUMENTATION
Long-toed salamander *(Ambystoma acrodactylum)*	S
Boreal (western) toad *(Bufo boreas)*	V
Leopard frog *(Rana pipiens)*	S
REPTILES	
Painted turtle *(Chrysemys picta)*	V
Rubber boa *(Charina bottae)*	S
Plains hognose *(Heterodon nasicus)*	V
Racer *(Coluber constrictor)*	S
Bullsnake *(Pituophis melanoleucus)*	V
Common garter snake *(Thamnophis sirtalis)*	V
Western garter snake *(Thamnophis elegans)*	S
Prairie rattlesnake *(Crotalus viridis)*	S
MAMMALS	
Masked shrew *(Sorex cinereus)*	S
Montane shrew *(Sorex monticola)*	S
Long-legged myotis *(Myotis volans)*	V
Long-eared myotis *(Myotis evotis)*	S
Pika *(Ochotona princeps)*	S
White-tailed jackrabbit *(Lepus townsendii)*	S
Yellow-pine chipmunk *(Eutamias amoenus)*	S
Yellow-bellied marmot *(Marmota flaviventris)*	S
Richardson's ground squirrel *(Spermophilus richardsonii)*	S
Columbian ground squirrel *(Spermophilus columbianus)*	S
Thirteen-lined ground squirrel *(Spermophilus tridecemlineatus)*	S
Golden-mantled ground squirrel *(Spermophilus lateralis)*	S
Black-tailed prairie dog *(Cynomys ludovicianus)*	V
Red squirrel *(Tamiasciurus hudsonicus)*	S
Northern pocket gopher *(Thomomys talpoides)*	S
Beaver *(Castor canadensis)*	V
Deer mouse *(Peromyscus maniculatus)*	S
Bushy-tailed woodrat *(Neotoma cinerea)*	V
Gapper's red-backed vole *(Clethrionomys gapperi)*	V
Heather vole *(Phenacomys intermedius)*	S

TABLE 3.6-1 (Cont'd)

MAMMALS (Cont'd)	OCCURRENCE DOCUMENTATION
Meadow vole *(Microtus pennsylvanicus)*	S
Montane vole *(Microtus montanus)*	S
Long-tailed vole *(Microtus longicaudus)*	V
Water vole *(Microtus richardsoni = Arvicola richardsoni)*	V
Sagebrush vole *(Lagurus curtatus)*	V
Muskrat *(Ondatra zibethicus)*	S
Porcupine *(Erethizon dorsatum)*	V
Coyote *(Canis latrans)*	V
Red fox *(Vulpes vulpes,* formerly *V. fulva)*	S
Black bear *(Ursus americanus)*	V
Grizzly bear *(Ursus arctos,* formerly *U. horribilus)*	V
Raccoon *(Procyon lotor)*	V
Marten *(Martes americana)*	V
Ermine *(Mustela erminea)*	S
Least weasel *(Mustela nivalis*, formerly *M. rixosa)*	S
Long-tailed weasel *(Mustela frenata)*	S
Mink *(Mustela vison)*	V
Badger *(Taxidea taxus)*	S
Striped skunk *(Mephitis mephitis)*	V
River otter *(Lutra canadensis = Lontra canadensis)*	S
Bobcat *(Lynx rufus = Felis rufus)*	V
Elk = wapiti *(Cervus elaphus,* formerly *C. canadensis)*	V
Mule deer *(Dama hemionus = Odocoileus hemionus)*	V
White-tailed deer *(Dama virginianus = Odocoileus virginianus)*	V
Moose *(Alces alces)*	V
Pronghorn *(Antilocapra americana)*	V
Mountain goat *(Oreamnos americanus)*	V
Mountain sheep *(Ovis canadensis)*	V

Occurrence Key

S indicates records documented by a specimen deposited in a university or other nationally recognized museum, including records from the formal literature in which a specimen record is described or implied. This is considered the highest level documentation.

V indicates visual or auditory evidence, including: specimens taken or found dead but not deposited in a university or other nationally recognized museum; photographs, unmistakable tracks or signs; and records where evidence is not specified.

[1] from Distribution of Montana Amphibians, Reptiles and Mammals, Larry S. Thompson 1982; Latilong #28.

TABLE 3.6-2

BIRDS IN THE HELENA AREA

COMMON NAMES	SEASON W S S F	HABITAT
Common Loon	U U - U	R
Pied-billed Grebe	- R R R	R
Horned Grebe	- U U U	R
Red-necked Grebe	- R - -	R
Eared Grebe	- C C C	R
●Western Grebe	- C C C	R
American White Pelican	- C C C	R,ST
●Double-crested Cormorant	- C C C	R,ST
American Bittern	- R - R	M
●Great Blue Heron	- C C C	R,ST,M
Snowy Egret	- V V -	M
Cattle Egret	- - - V	M,G
Black-crowned Night Heron	- R R R	R,M
White-faced Ibis	- R - -	M
Tundra (Whistling) Swan	- C - U	R
Trumpeter Swan	- R - -	R
Greater White-fronted Goose	- - - V	R
Snow Goose	- C - C	R
Ross' Goose	- R - R	R
●Canada Goose	C A A A	R,ST,M,G
●Wood Duck	- R R R	R,ST
●Green-winged Teal	- C C C	R,ST
●Mallard	C A A A	R,ST,M
●Northern Pintail	- C C C	R
●Blue-winged Teal	- C C C	R
●Cinnamon Teal	- U U U	R,ST
Northern Shoveler	- U U U	R
●Gadwall	U C C C	R
Eurasian (European) Wigeon	- V - V	R
●American Wigeon	- C C C	R
Canvasback	- R R R	R
●Redhead	- U - U	R
Ring-necked Duck	- R R R	R
Greater Scaup	- - - V	R
Lesser Scaup	- U U U	R
Harlequin Duck	- V - V	ST
Oldsquaw	V - - -	R
Surf Scoter	- - - V	R
White-winged Scoter	- R - R	R
Common Goldeneye	C C U C	R
Barrow's Goldeneye	U U U U	R,ST
Bufflehead	U U U U	R
Hooded Merganser	- R - R	R
●Common Merganser	C C C C	R,ST
Swainson's Hawk	- - R -	G,S
●Red-tailed Hawk	R C C C	G,CR,JS
Ferruginous Hawk	- R - -	G,S
Rough-legged Hawk	C R - R	G
●Golden Eagle	R R R R	G,CL,S
●American Kestrel	R U U U	G,CR,S
●Merlin	R R R R	M,G,CR
Peregrin Falcon	R R R R	R,G,M,ST
Gyrfalcon	R - - -	G
●Prairie Falcon	R R R R	G,CL
●Gray Partridge	U U U U	G
●Ruffed Grouse	U U U U	MR,CF
●Ring-necked Pheasant	R R R R	G
●Blue Grouse	R R R R	CF
●Sora	- - R R	M
●American Coot	U A C A	R
●Sandhill Crane	- C C C	G,M
Black-bellied Plover	- R - R	R
Semipalmated Plover	- U - U	R
●Killdeer	R A A A	R,ST,G
Black-necked Stilt	- - V V	R,M
American Avocet	- C C C	R,M
Greater Yellowlegs	- U U U	R,M
Lesser Yellowlegs	- C C C	R,M
Solitary Sandpiper	- R - R	R,ST,M
Willet	- R - R	R,M
●Spotted Sandpiper	- C C C	R,ST
Whimbrel	- - V -	M,L
●Long-billed Curlew	- R R -	G
Marbled Godwit	- R - R	R
Sanderling	- R - R	R
Semipalmated Sandpiper	- R - R	R
Western Sandpiper	- R - R	R,M
Least Sandpiper	- C C U	R,M
Baird's Sandpiper	- U - U	R,ST
Pectoral Sandpiper	- R U U	R,M
Dunlin	- R - R	R
Stilt Sandpiper	- - - V	R,M
Long-billed Dowitcher	- U C C	R,M
●Common Snipe	R C C C	R,ST,M
●Wilson's Phalarope	- C C C	R
Red-necked (Northern) Phalarope	- R - R	R
Long-tailed Jaeger	- V - V	R

TABLE 3.6-2 (Cont'd)

	SEASON	
COMMON NAMES	W S S F	HABITAT
Red-breasted Merganser	- U - U	R,ST
Ruddy Duck	- U U U	R
●Turkey Vulture	- U U U	CR,G,CL
●Osprey	- U U U	R,ST
●Bald Eagle	C R R R	R,ST
●Northern Harrier (Marsh Hawk)	R U U U	M,G
●Sharp-shinned Hawk	R R R R	MR,CR,CF
●Cooper's Hawk	R R R R	MR,CR,CF
Northern Goshawk	U - - -	MR,CR,CF
Northern Saw-Whet Owl	R R R R	CR,CF
Western Screech Owl	R R R R	CR,CF
●Great Horned Owl	C C C C	CR,MR,CF
*Snowy Owl	R - - -	G
●Northern Pygmy Owl	R R R R	CF,CR,MR
●Burrowing Owl	- R R -	G
Long-eared Owl	R R R R	CR,CF,MR
●Short-eared Owl	R R R R	G,M
●Common Nighthawk	- R C R	G,CF
●White-throated Swift	- - R -	CL
Black-chinned Hummingbird	- R R -	MR
●Calliope Hummingbird	- U U -	MR
●Rufous Hummingbird	- U U -	MR
●Belted Kingfisher	R C C C	ST
●Yellow-bellied Sapsucker	- R R R	MR,CF,CR
●Downy Woodpecker	U U U U	CR,MR,CF
●Hairy Woodpecker	U U U U	CR,MR,CF
●Northern Flicker	C C C C	CR,MR,H
●Horned Lark	C C C C	G
Olive-sided Flycatcher	- - R -	CR,CF
●Western Wood-Pewee	- U A U	CR,CF
●Willow Flycatcher	- - C C	CR,MR
●Hammond's Flycatcher	- - C -	CF
●Dusky Flycatcher	- - C -	CF
●Western Flycatcher	- - U -	MR,CF
●Say's Phoebe	- R R R	G
●Western Kingbird	- R R R	G
●Eastern Kingbird	- C C U	G,CR
●Tree Swallow	- A A -	MR,CR
●Violet-Green Swallow	- C C -	MR,CR
●Northern Rough-winged Swallow	- C C -	R,ST,H
●Bank Swallow	- U U -	R,ST
●Cliff Swallow	- A A -	R,ST,CL,H
●Barn Swallow	- C C U	R,ST,CL,H
Gray Jay	R - - -	CF
Franklin's Gull	- R C -	R
Bonaparte's Gull	- R R R	R
●Ring-billed Gull	R A A A	R,ST,H
California Gull	R C C R	R,ST
Herring Gull	- - - R	R
Common Tern	- U U U	R
Black Tern	- U U U	R,M
●Rock Dove	A A A A	H,CL
●Mourning Dove	- C C C	G,CF,CR
Black-billed Cuckoo	- R R -	CR
Hermit Thrush	- U -U	MR,CF
●American Dipper	U U U U	ST
●Golden-crowned Kinglet	R R R R	CF
●Ruby-crowned Kinglet	- C C -	CF
●Mountain Bluebird	- C C C	G,B,MR
●Townsend's Solitaire	U U U U	CF,JS
●Veery	- U U -	CR
Swainson's Thrush	- U - U	MR,CF
●American Robin	R A A A	CR,MR,CF,H
Varied Thrush	V - - V	CR
●Gray Catbirds	- U C R	CR,MR
Sage Thrasher	- - R -	S
Brown Thrasher	- - V -	CR
Water Pipit	- U - U	G
Bohemian Waxwing	A C - A	CR,CF,H
●Cedar Waxwing	R U A A	CR,MR,CF,H
Northern Shrike	U - - -	CR,G
Loggerhead Shrike	- - R -	CR,G
●European Starling	A A A A	CR,G,H
●Warbling Vireo	- - C U	CR,MR
●Red-eyed Vireo	- R R R	CR,MR
Tennessee Warbler	- V - V	CR
●Orange-crowned Warbler	- U U U	MR
●Yellow Warbler	- A A U	CR,MR
●Yellow-rumped Warbler	- C C U	MR,CF
Black-and-white Warbler	- V - -	
●American Redstart	- U U -	CR,MR
●Northern Waterthrush	- U U -	CR,MR
●MacGillivray's Warbler	- U U -	CR,MR
●Common Yellowthroat	- C C U	CR,M
Wilson's Warbler	- U - U	MR
●Western Tanager	- U U U	CF,MR,C
Rose-breasted Grosbeak	- - V -	CR
Black-headed Grosbeak	- - R -	MR,CR
●Lazuli Bunting	- - C -	B,MR,CR
●Rufous-sided Towhee	- C C -	B,CR
●American Tree Sparrow	C U - U	B,G,H

TABLE 3.6-2 (Cont'd)

COMMON NAMES	SEASON W S S F	HABITAT
Stellar's Jay	R - - -	CF
Blue Jay	- R - R	CR
●Pinyon Jay	U U U U	JS
●Clark's Nutcracker	U U U U	CF
●Black-billed Magpie	A A A A	CR,G,H
●American (Common) Crow	- C C U	CR,G
●Common Raven	A U U U	MR,CR,G
●Common-capped Chickadee	A A A A	CF
●Mountain Chickadee	C C C C	CR,MR,CF
●Red-breasted Nuthatch	U U U U	MR,CF,JS
●White-breasted Nuthatch	R R R R	MR,CR
●Pygmy Nuthatch	R R R R	MR
●Brown Creeper	R R R R	MR,CR
●Rock Wren	- - U -	CL
Canyon Wren	- - R -	CL
●House Wren	- U U U	CR,H
●Red-Winged Blackbird	U A A C	M,G
●Western Meadowlark	R A A U	G
●Yellow-headed Blackbird	- U U U	M,R
Rusty Blackbird	- V - V	CR
●Brewer's Blackbird	R A A C	G,CR
Common Grackle	- - R -	G,CR,H
●Brown-headed Cowbird	- C C -	G,CR,MR
●Northern Oriole	- U U -	CR
*Rosy Finch		
Gray-crowed Race	R - - -	G
Black Race	R - - -	G
Pine Grosbeak	U - - -	CF
Purple Finch	- R - -	MR,H
●Chipping Sparrow	- C C C	MR,CF
●Clay-colored Sparrow	- - U -	G,B
●Brewer's Sparrow	- U U -	S,G
●Vesper Sparrow	- C C C	G
●Lark Sparrow	- U U U	G
Lark Bunting	- - R -	G
●Savannah Sparrow	- C C C	G
Baird's Sparrow	- - - V	G
●Song Sparrow	U C C C	CR,ST,B
White-crowned Sparrow	R - - R	CR,B
Harris' Sparrow	R R - -	CR
●Dark-eyed Junco	C C C C	CF,MR,CR,H
McCown's Longspur	- R - -	G
Lapland Longspur	R - - -	G
Chestnut-collared longspur	- - R -	G
*Snow Bunting	U - - -	G
●Bobolink	- U U -	G
●Cassin's Finch	U A A C	MR,CF,H
●House Finch	C C C C	MR,H
*Red Crossbill	U - - -	CF
White-winged Crossbill	R - - -	CF
Common Redpoll	U - - -	CR,G,H
Hoary Redpoll	V - - -	CR,G
●Pine Siskin	C A A A	MR,CF,H
●American Goldfinch	- - U -	CR.MR
●Evening Grosbeak	C A C A	MR,CF,H
●House Sparrow	A A A A	H

TABLE 3.6-2 (Cont'd)

KEY TO TABLE 3.6-2

Abundance The abundance of a particular species is shown in the second column, by season of the year. The abundance depends on the frequency with which it is sighted on visits to the appropriate habitat in the appropriate seasons, and on the number of individuals sighted per visit.

A = Abundant	Seen in large numbers on most visits to the proper habitat in the proper season.
C = Common	Seen on only about two-thirds of the visits or in smaller numbers.
U = Uncommon	Seen on no more than about one-third of the visits or never seen in large numbers.
R = Rare	Seen on no more than 5-10% of visits or restricted to a small proportion of the preferred habitat or to a specific limited habitat.
V = Vagrant	Accidental in occurence.
- = Not Present	Not seen in a particular season

Status	•	Breeds locally (From P.D. Skaar, 1985)
	*	Irregular. Common or abundant in some years, rare or absent in others.
Season	W	Winter: mid-November to mid-February
	S	Spring: mid-February to mid-May
	S	Summer: mid-May to mid-August
	F	Fall: mid-August to mid-November
Habitat	R	Reservoirs, lakes, ponds
	ST	Streams
	M	Marshes
	S	Sagebrush
	CL	Cliffs
	G	Grasslands
	MR	Mountain riparian
	CR	Cottonwood Riparian
	JS	Juniper/sagebrush
	CF	Conifer forest
	B	Brush
	H	Human development, Ornamental trees and shrubs

SOURCE: Birding in the Helena Valley, Last Chance Audubon Society, 1986

TABLE 3.6-3

MONTANA FISHES THAT MAY OCCUR OR ARE KNOWN TO OCCUR IN THE STUDY AREA

Common Name	Genus & Species	Occurrence
Channel Catfish	*Ictalurus punctatus*	N *
Stonecat	*Noturus flavus*	N
Longnose Sucker	*Catostomus catostomus*	N
White Sucker	*Catostomus commersoni*	N
Mountain Sucker	*Catostomus platyrhynchus*	N
Goldfish	*Carassius auratus*	I
Common Carp	*Cyprinus carpio*	I
Utah Chub	*Gila atraria*	I
Flathead Chub	*Hybopsis gracilis*	N
Flathead Minnow	*Pimephales promelas*	N
Longnose Dace	*Rhinichthys cataractae*	N
Yellowstone Cutthroat Trout	*Oncorhynchus clarki bouvieri*	N * C
Westslope Cutthroat Trout	*Oncorhynchus clarki lewisi*	N * C
Rainbow Trout	*Oncorhynchus mykiss*	*n* * *c*
Kokanee	*Oncorhynchus nerka*	I *
Mountain Whitefish	*Prosopium williamsoni*	N *
Brown Trout	*Salmo trutta*	I *
Brook Trout	*Salvelinus fontinalis*	I *
Burbot	*Lota lota*	N *
Mosquitofish	*Gambusia affinis*	I
Variable Platyfish	*Xiphophorus variatus*	I
Pumpkinseed	*Lepomis gibbosus*	I
Smallmouth Bass	*Micropterus dolomieui*	I *
Largemouth Bass	*Micropterus salmoides*	I *
Black Crappie	*Pomoxis nigromaculatus*	I
Yellow Perch	*Perca flavescens*	I
Walleye	*Stizostedion vitreum*	I *
Mottled Sculpin	*Cottus bairdi*	N

SYMBOLS: N = Native I = Introduced P - Possibly native

n = A few populations of native Rainbow Trout persist in the Kootenai River Drainage of northwestern Montana. All other Rainbow Trout populations in the state originated from hatchery fish and are considered introduced.

C = A fish of special concern.

c = The native Rainbow Trout is a fish of special concern. Introduced Rainbow Trout are not (*see n* above).

* = Designated a game fish in Montana statutes.

SOURCE: A Field Guide To Montana Fishes, George D. Holton, 1990

3.6.4.1 Bald Eagle

The number of nesting bald eagles has been on the rise throughout Montana since 1980, particularly in the Helena Valley and study area. Bald eagles occur on a regular basis in the upper Missouri River corridor and reservoir (Chaffee 1990). Eagles are most numerous from November to early April, when they feed in the vicinity of the nearby reservoirs on the Missouri River. Current trends indicate larger numbers of eagles are wintering in the study area, possibly as a result of an increased food base, comprised primarily of migrating salmon and dead perch. Three known eagle aeries are located along Hauser Lake and the potential for additional nest sites is apparent (Flath 1992). This study area is situated well within the hunting range of bald eagles.

3.6.4.2 Peregrine Falcon

Peregrines nest in high cliffs, generally within a mile of a river or stream, and typically occupy the same territory from year to year. There is likely peregrine habitat along the Missouri River corridor near the study area. In fact, a peregrine falcon reintroduction site is located approximately three miles from Site E. Peregrines reintroduced to this area have successfully adapted to the habitat conditions along the Missouri River and additional reintroductions are likely in the future. It is also anticipated that natural reproduction will increase the local population (Flath 1992).

3.6.5 Wildlife Specific to Alternative Sites

Wildlife and habitat are inseparable; the ability to move to and from suitable habitat is inherent to free-ranging wildlife. Habitat loss and/or fragmentation is substantial throughout the Helena Valley. Continued development poses a real threat to a number of wildlife species. The potential loss or degradation of critical habitat presents the greatest concern. None of the proposed landfill sites overlap designated critical habitat for any species. However, each site currently offers habitat to various wildlife species.

3.6.5.1 Proposed Action - Site E

Site E encompasses land cultivated for winter wheat. Grain fields provide an important food source for several species, most notably upland game birds, waterfowl, and various migratory birds. Antelope use this site as the terrain is rough and provides security cover. Other species use the site incidently or year-round, although occupation does not necessarily connote habitat preference. Site E is located in close proximity to Lake Helena, the Regulating Reservoir, and Hauser Lake, all of which provide a preferred feeding area for many species. Numerous wildlife species (including rare migrants) may be found in habitats associated with these water bodies.

3.6.5.2 Site A

Site A encompasses both native range and cultivated wheat fields. The southern exposure of the steep topography provides highly preferred antelope winter range. Use of the grain crops is less evident as the site is isolated from large bodies of water. Deer use is common. Incidental and year-round use by various other species also occurs, however, this habitat does not provide critical needs for these species.

3.6.5.3 CCSS Landfill

The CCSS site is used as an active landfill. This land use has effectively excluded most wildlife. Wildlife commonly found on the site include scavenger species of birds and mammals. This artificial food source is not critical to their continued existence.

3.7 VEGETATION

The study area for vegetation analysis is confined to the Helena Valley. Much of the information used in the following description is from the species inventory conducted by the Montana Natural Heritage Program (1992). Personal observations of vegetation types and occurrences at the alternative sites were made during EIS preparation.

Vegetation patterns in the Helena Valley are dictated by topography and the low precipitation, semiarid climate. The Helena Valley can generally be described as a foothill valley, approximately 10 miles long and 12 miles wide. The Missouri River bounds the east side of the Valley. Gently rolling grasslands give rise to a Lodgepole Pine/Douglas-fir forest as the valley rises to the south, west, and north. Traditional livestock grazing of the native range has slowly given way to increased agricultural development. Small grain cropland production, introduced hayland, and improved pasture evolved as irrigation systems have developed. The incorporated cities of Helena and East Helena have dramatically altered adjacent vegetation communities. Continual growth of rural housing over the past decade has accelerated vegetative fragmentation and the introduction and expansion of exotic species. Current estimates derived from aerial photo interpretation place approximately 10 percent of the Helena Valley in a "natural" condition, 70 percent in agricultural production, and 20 percent in urban and rural development.

Table 3.7-1 contains a listing of common vegetative species, native and introduced, found in the Helena Valley.

3.7.1 Vegetative Patterns in the Study Area

Native vegetation in the Helena Valley is dominated by one rangeland type, Foothill Grasslands. Grasses such as the wheatgrasses and the fescues predominate on the lower mountain slopes and on the more elevated benches where soil texture is loamy to coarse. In the lowlands where soil texture is generally finer, short grasses such as the gramma grasses are present. Common upland grass species include prairie junegrass, needle-and-thread, and Sandberg bluegrass. Mesic species consist of sedges,

TABLE 3.7-1

COMMON VEGETATIVE SPECIES FOUND IN THE STUDY AREA[1]

wheatgrasses (*Agropyron* spp.)
fescues (*Festuca* spp.)
gramma grasses (*Bouteloua* spp.)
prairie junegrass (*Koeleria cristata*)
needle-and-thread (*Stipa comata*)
sandberg bluegrass (*Poa sandbergii*)
sedges (*Carex* spp.)
sloughgrass (*Beckmania syzigachne*)
common reedgrass (*Phagmites communis*)
reed canarygrass (*Phalaris arundinacea*)
legumes (*Astragalus* spp.)
phlox (*Phlox* spp.)
pussytoes (*Antennaria* spp.)
hairy goldenaster (*Heterotheca villosa*)
arrowleaf balsamroot (*Balsamorhiza sagittata*)
big sagebrush (*Artemisia tridentata*)
fringed sagewort (*A. frigida*)
winterfat (*Cenratoides lanata*)
antelope bitterbrush (*Purshia tridentata*)
Rocky mountain juniper (*Juniperus scopulorum*)
mountain mahogany (*Cercocarpus ledifolius*)
greasewood (*Sacrobatus vermiculatus*)
saltbrush (*Atriplex* spp.)
locoweed (*Zygadenus* spp.)
lodgepole pine (*Pinus contorta*)
Douglas-fir (*Pseudostuga menzisii*)
pinegrass (*Calamagrostis rubescens*)
grouse whortleberry (*Vaccinium scoparium*)
cottonwood (*Populus* spp.)
willow (*Salix* spp.)
serviceberry (*Amelanchier alnifolia*)
alfalfa (*Medicago sativa*)
bluebunch wheatgrass (*Agropyron spicatum*)
crested wheatgrass (*A. cristaum*)
smooth bromegrass (*Bromus inermis*)
timothy (*Phleum* spp.)
wheat (*Triticum aestivum*)
barley (*Hordeum vulgare*)
oats (*Avena* spp.)

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[1] Not necessarily all inclusive. Compiled as a vegetative guide during EIS development.

sloughgrass, common reedgrass, and reed canarygrass. Common upland forbs consist of legumes, phlox, pussytoes, hairy goldenaster, and arrowleaf balsamroot. Grassland shrubs are principally big sagebrush, fringed sagewort, winterfat, and antelope bitterbrush. Rocky mountain juniper, and mountain mahogany are found on rocky sites. On the more poorly drained soil, species such as greasewood, saltbrush, and locoweed are present (Lorenz and Swenson 1951).

Lodgepole pine/Douglas-fir forest can be found on mesic north-facing slopes at intermediate elevations. The understory is generally dominated by pinegrass or grouse whortleberry. Cottonwood, willow, and serviceberry grow along stream courses in the Helena Valley.

Land is extensively used in the Helena Valley. Agriculture production of irrigated and dryland forage and food crops is widespread. Primary forage crops include alfalfa, bluebunch wheatgrass, crested wheatgrass, smooth bromegrass, and timothy. Production of food crops centers mainly on wheat, barley, and oats.

3.7.2 Wetlands

Wetlands are abundant throughout the Helena Valley. Wetlands in the study area occur in two distinct settings, either as discrete units entirely made up of wetlands, or as part of larger riparian or aquatic ecosystems. These wetlands range from a few square feet to hundreds of acres in size. The majority of wetlands in the project area are small and cannot be delineated at common mapping scales. Larger wetlands associated with springs have been intermittently mapped throughout the study area. A complete inventory of all wetlands in the Helena Valley has not been conducted.

Several federal and state agencies have jurisdiction and involvement in wetlands issues and protection in Montana. Currently a no-net-loss policy is being emphasized on developments that may impact a designated wetland. State regulations prohibit the establishment of a landfill in delineated wetlands. However, wetlands are not known to be present on any of the potential landfill sites.

3.7.3 Noxious Weeds

Noxious weeds are an important local concern due to their impacts on agriculture production and native plant communities. Lewis & Clark County has an active weed control program. While success is apparent in control of some local weeds, other species have shown resistance to all past control strategies.

The Montana Noxious Weed Control Act identifies nine Category One and five Category Two noxious weed species. Category One weeds are found at some level of infestation in Montana, with control efforts targeted at containment and preventing further spread to uninfested areas. Category One weeds found in the landfill study area include Canada thistle and leafy spurge, which have invaded many disturbed sites throughout the area. Leafy spurge is extremely difficult to control and is considered to pose the greatest weed threat for future area developments. Category Two weeds are much more limited in Montana. It is not known whether weeds in this category have been documented in the study area.

Other weed species of local concern are hound's tongue, spotted knapweed, diffuse knapweed, burdock, musk thistle, whitetop, and dalmation toadflax. All weeds with the exception of leafy spurge can be controlled through an integrated pest management plan including chemical, biological, and mechanical methods. Some infestation of noxious weeds has occurred at each of the alternative landfill sites. Of greater concern would be the potential for spread of noxious weeds due to excavation, construction, and operation of a landfill at any of the sites. This issue is discussed in section 4.7.3.

3.7.4 Threatened, Endangered and Sensitive Species

Species of special concern would include species listed as endangered or threatened by the USFWS, those under review for endangered and threatened status, and species considered imperiled or critically imperiled by the Montana Natural Heritage Program (1992). No threatened or endangered plant species are known to occur in the study area.

3.7.5 Vegetation Specific to Alternative Sites

3.7.5.1 Proposed Action - Site E

Site E has traditionally been cultivated as a wheat field. Current use of the site includes the mining of clay borrow material. The County has indicated that the disturbed area will be reseeded with range grasses and forbs (Montana DSL 1992). Several small draws on the site retain some native vegetation. Weed control has revolved around herbicide application in conjunction with the farming activity.

3.7.5.2 Site A

Site A encompasses both native rangeland and cultivated wheat. The relatively steep topography on the site contains native grasses and forbs. Weed control of the cultivated land has been accomplished with herbicide application. Invasion of weeds on the native range is minimal.

3.7.5.3 CCSS Landfill

Vegetation on the CCSS site includes invasion of numerous annual weedy plants. The native range on the site is highly disturbed due to ongoing landfill activity. Dryland farming has occurred over much of the surrounding land. Secondary succession of the landfill cells is occurring by invasion of these annual species. Little artificial revegetation has occurred. Designated noxious weeds are controlled through herbicide application.

3.8 CULTURAL RESOURCES

Cultural resources consist of archaeological, historical, and traditional cultural properties. These properties are considered significant and are afforded protection when they (1) are listed on the National Register of Historic Places, or (2) have been determined eligible for listing. A site can be placed on the Register if it is determined to have local, state, or national significance in one or more categories.

Prehistoric sites are usually determined eligible because of their potential to yield important information concerning the lifeways of their inhabitants and the environment in which they lived. Historic sites may also be significant for that reason; however, they may also be important due to architectural features or as representatives of important events in the region's history. Traditional cultural properties are those important to American Indian groups. These types of sites include traditional plant-gathering areas, vision quest sites, cairns or burials, battlefields, and other geographic locations important for religious or cultural reasons.

For any of the sites to be eligible, they must have integrity of "location, design, setting, materials, workmanship, feeling, and association" (36 CFR 60.4). The Montana State Historic Preservation Officer must also be consulted during the process of determining eligibility. Additionally, access to religious sites significant to American Indians is restricted under the American Indian Religious Freedom Act. Protection of burials and associated artifacts is mandated by the Native American Graves Protection and Repatriation Act.

There have been a number of surveys for cultural resources in the vicinity of the three alternative landfill locations. Prehistoric sites located by these surveys include lithic scatters, tipi rings, and a stone quarry (tool material source). Some of these sites also included hearths or roasting pits. Sites with tipi rings and/or hearths/roasting pits suggest campsites and food preparation activities. Lithic scatters usually consist of just the remains of stone tool manufacture, indicating a shorter time of occupation; perhaps not even a full day and night. For the most part, information collected during the survey was not sufficient to place these sites in a specific time period or determine use by an identifiable group. Historic sites recorded during these surveys include a mine, church, and homesteads and ranches. Determinations of eligibility for the National Register have not been made for the majority of these sites, and none of them are currently listed on the National Register.

Archaeological evidence of occupation of the Helena region dates back at least 11,000 years when the area was inhabited by people following a tradition of hunting big game (the "Paleo-Indian Period"); much of this game is now extinct. As the climate changed to a hotter and drier regime approximately 7,000 years ago, it appears occupation (Early Plains Archaic) was more intense in the foothills and mountains than on the plains. Subsistence strategies changed from a reliance on big game to a mixed hunting and plant gathering strategy. This strategy, with the concurrent seasonal movement of the inhabitants, remained essentially unchanged in later periods (Middle and Late Plains Archaic and Late Prehistoric); however, there was a greater reliance on the buffalo (Frison 1978). The introduction of the horse and Euro-American weapons, goods, and lifestyles strengthened the association with the buffalo and allowed greater mobility. The general project area was probably used by the native populations throughout these later periods.

The Lewis & Clark expedition up the Missouri River in 1805 reported encounters with Flathead-Salish people in this area (Greiser and Newell 1980). Ethnographic evidence exists, showing that this was Flathead territory dating back perhaps to A.D. 1000 (Knight 1989). The area was probably also inhabited by Shoshonean groups moving up from Wyoming and the Great Basin. Some sites in the general region, dating to the late prehistoric period, have been interpreted as being proto-Shoshonean (Greiser and Newell 1980). The Shoshone were displaced during the historic period, most likely by Blackfeet moving in from the north and east. Other historic American Indian groups to use or travel through the area may have included the Crow, Northern Cheyenne, Gros Ventre, and Assiniboine (Knight 1989).

Early Euro-American history of the area is dominated by mining activities, and transportation on the Missouri River. Trapping and trading preceded mining, followed by ranching and farming.

No prehistoric sites have been recorded within the boundaries of any of the three alternative landfill locations. Sites that might be expected to occur include short-term campsites and lithic scatters, however site densities were probably higher to the east, closer to the Missouri River and drainages leading to it. The chances for good site integrity are probably low due to the agricultural or other type of disturbance on much of the land considered for landfill siting.

3.8.1 Proposed Action - Site E

The entire area of this site is currently or recently cultivated. Additional disturbance includes two parallel high voltage transmission lines crossing the site in a northeast/southwest direction. In 1990, Mr. Dave Schwab, Archaeologist with the Montana Historical Society, inspected the property. It is his opinion that, given the agricultural disturbance and the environmental and topographical situation, there is a low potential for significant prehistoric resources at this site (Schwab 1990). Historic resources include a log structure and farming-related debris. Local residents believe that this site may be the location of an early school (Marshall 1990b). The site has not been recorded or evaluated as to its eligibility for the National Register. The 1869 General Land Office (GLO) Plat Map (Greiser and Newell 1980) of T11N, R2W shows a road (or trail) running eastwest through the center of Section 32, and a segment of Dana's Bar Ditch in the southeast quarter of the section. It also labels the area including Section 32 as agricultural. The Plat Map indicates no structures in the section; historic activity appears concentrated more to the east along the Missouri River. There are no historic ranches or homesteads located in the immediate vicinity of this site.

3.8.2 Site A

This site does not appear to have been recently cultivated. The topography is gently rolling hills with no permanent water supply. Vegetation consists of various short grasses. There are no recorded resources at this site; however, no surveys have been performed.

3.8.3 CCSS Landfill

This site is currently in use as a solid waste disposal facility. Portions of the site not currently in use are planted in wheat. The topography is gently sloping to the west and northwest with no permanent water supply. No resources have been recorded at this site; however, no surveys have been performed. There are no unrecorded historic sites or structures at this location. The Kleffner Ranch, located northwest of the landfill, has not been recorded or evaluated for its potential eligibility to the National Register.

3.9 ROADS AND TRANSPORTATION

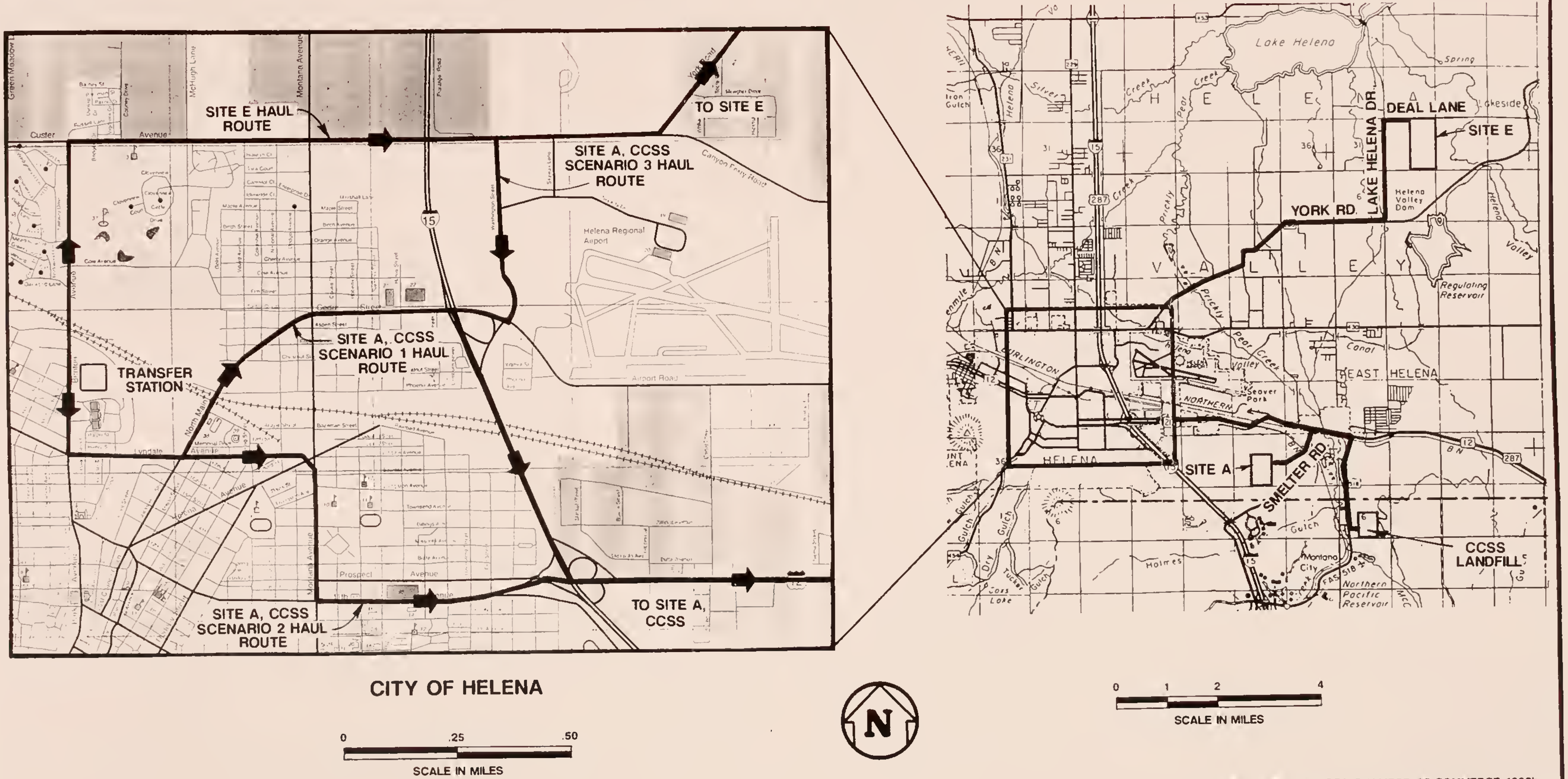
Development and operation of a new landfill would require the use of various roads in the cities of Helena and East Helena, and in unincorporated portions of Lewis and Clark and Jefferson Counties as haul routes for solid waste materials. Regardless of which alternative landfill site is selected, it is assumed that waste materials would be collected at the City of Helena transfer station and transported by large trucks to the selected landfill site. Approximately seven 18-ton refuse trucks per day would use the selected alternative solid waste haul route. No other transportation modes, such as rail or self-haul, would normally be used. This section addresses the existing transportation network that could be impacted by landfill development at each of the alternative sites.

All three alternatives are located in the Helena Valley. Sites E and A are located in southern Lewis and Clark County, while the CCSS Landfill is in northern Jefferson County. Site E is located to the northeast of the Helena/East Helena urban area, two miles west of the community of Lakeside. Sites A and the CCSS Landfill are both generally located to the south of the City of East Helena. Since traffic circulation in the study area could potentially be affected by solid waste hauling activities, the following discussion provides a description of the most likely solid waste haul routes for each of the alternative sites. It also describes current conditions on those haul routes with respect to traffic volumes, traffic congestion problem areas, truck traffic, high accident locations, and hazards associated with inclement weather. Figure 3.9-1 provides a map of the study area and the potential haul routes described in this section.

When evaluating traffic congestion, the level of service (LOS) at critical intersections was considered. LOS is a widely recognized measure of operational conditions on a roadway. The various levels are defined as follows:

- LOS A - represents a completely unimpeded roadway where traffic is so light that vehicles can maneuver freely with minimal delays at intersections
- LOS B - represents a traffic conditions where the ability of vehicles to maneuver on a roadway is only slightly restricted and stopped delays are short and not considered bothersome
- LOS C - represents a traffic condition where the ability of vehicles to maneuver is restricted, average travel speeds are similarly reduced, and tension is experienced by drivers
- LOS D - represents roadways where even small increases in traffic flow may cause substantial delays and decrease average travel speeds
- LOS E - represents significant travel delays, highly restricted vehicle maneuverability, and significantly reduced travel speeds
- LOS F - represents the worst possible roadway condition, with low travel speeds and long delays

(LOS ratings for each intersection considered for each haul route are included later in Table 3.9-2.)



SOURCE: HELENA AREA CHAMBER OF COMMERCE 1992b AND DAMSCHEN & ASSOCIATES 1987 AND 1990b

Job No. :	23050
Prepared by :	C.P.F.
Date :	4/5/93

SOLID WASTE HAUL ROUTES

FIG. 3.9-1

Design, improvements, and maintenance of individual roads of the various hauling routes considered is the responsibility of different governmental agencies. State and federal money is available for this work for designated roadways through the federal Intermodal Surface Transportation Efficiency Act of 1991. There are two different roadway designations for funding decision-making in this law: 1) the National Highway System (NHS) which includes Interstate highways and designated arterial state highways (i.e. Highway 12/287) and 2) the Surface Transportation Program (STP). The STP is a block grant program that provides funding for maintenance, repair, and improvement of the designated State Urban and Secondary Routes that replaced the former federal aid program. Basically the way the system works a combination of federal and state funds are provided annually to the State, Counties, and Cities in allocated amounts to be used on projects for the designated roadways in the program. The State, County, or City has the responsibility to decide which projects will be funded by these programs each year. Additional work is then funded solely by the individual entities. For example State Secondary roadways, under the County's jurisdiction (i.e. York Road and Highway 518), receives an annual block grant consisting of approximately 86% federal funds and 14% state funds to support these roadways. The County has discretion as to which projects will be funded by this grant money. For example the York Road Warren School realignment project was constructed using STP funds. The City of Helena has jurisdiction over the urban system and the State of Montana through the Montana Department of Transportation has jurisdiction over the NHS. The classification of the various roadways projected for use in the analysis of the different alternative haul routes are: NHS - Interstate 15 and Highway 12/287 (includes Prospect and 11th Avenues); State Urban Aid - Benton Avenue, Custer Avenue, Washington Street, North Main Street, and Cedar Street; State Secondary Aid - York Road, Highway 518 (a portion of this road is in Jefferson County also). Local roads considered in this EIS that maintenance would be fully funded by County funds are: Lake Helena Drive, Deal Lane, and Smelter Road.

3.9.1 Proposed Action - Site E

The following haul route would be used for transporting solid waste from the transfer station to Site E (refer to Figure 3.9-1): Trucks would turn north (right) on Benton Avenue and proceed to Custer Avenue. They would then turn east (right) on Custer and proceed across Interstate 15 to the Custer Avenue/Canyon Ferry Road split. The trucks would then follow York Road (northeast) for approximately four and one half miles, passing through the new alignment at Warren School to Lake Helena Drive. The trucks would then turn north (left) on Lake Helena Drive and proceed to Deal Lane, where they would turn east (right) and proceed to the landfill access road on the south (right) side of Deal Lane.

The roads along the proposed haul route to Site E are described in terms of existing surface type, lane width, and adjacent land use as follows:

- Benton Avenue - a paved two-lane road that passes alongside the Bill Roberts Golf Course and single family residential homes. Railroad tracks cross this route a short distance to the north of the transfer station entrance.
- Custer Avenue - a paved two-lane road that passes a combination of residential, commercial, and recreational land properties. The route includes the Four Georgians School, east of Benton Avenue and adjacent to Custer Avenue on the south side. Signs indicating the proximity of the

school and pedestrian crossings are on Custer Avenue in the vicinity of the Four Georgians. Recent business development at the corner of Custer Avenue and Montana Avenue includes the opening of a ShopKo department store, which is expected to increase traffic and stimulate other businesses to locate in the area. The road also crosses a bridge over Interstate 15 and continues past the junction with Canyon Ferry Road and the City limits.

- York Road - a two-lane paved road that passes land used mostly for rural residences and agricultural uses. Single family homes are found along the route. In addition, the Warren School is located adjacent to York Road. The road in the vicinity of the school was recently realigned to eliminated the so-called "Warren Curve," so that the road path is now north of the school. The route also crosses a bridge that spans the channel of Prickly Pear Creek.

- Lake Helena Drive - a two-lane gravel road that passes a golf course and planned residential subdivision. The majority of land along Lake Helena Drive is currently vacant or used for agricultural purposes.

- Deal Lane - a two-lane dirt and gravel road that climbs a relatively steep grade from Lake Helena Drive to the proposed Site E landfill area. Land use along Deal Lane is predominantly vacant or agricultural. Approximately five single family homes are scattered along this road between Lake Helena Drive and Site E.

Average daily traffic counts have been collected for numerous streets and highways in the City of Helena and Lewis and Clark County. Over the life of the landfill, the population and economy of the Helena Valley will grow (refer to section 3.12). As a part of the Helena urban transportation planning process, travel forecasts were made for the years 2000 and 2010. These were based on the existing street system, planned transportation improvement projects, and projected growth in the valley. These forecasts identified substantial increases in traffic volume and congestion over the next 10 to 20 years (Robert Peccia and Associates 1992). Table 3.9-1 provides a list of streets along the various solid waste haul routes, their average daily traffic (ADT) counts for years 1991/1992, and projected ADTs for the year 2010. Average daily traffic is the total volume of traffic over a 24-hour period at a given location on a roadway. For example, Custer Avenue is the busiest street in the Site E haul route, both at the present time and in the future.

Additionally, intersections found along the haul routes have been classified with respect to traffic congestion. These are identified with associated delay times in Table 3.9-2. For the Site E route, the intersection of Custer Avenue/Montana Avenue was the only one considered to be congested (Robert Peccia and Associates 1992). Delay periods during rush hour currently range from 15 to 25 seconds, but the delay is projected to increase to 60 seconds or more by 2010. This intersection currently has an LOS C rating, which is expected to decrease to LOS F by 2010.

High-accident locations were also identified during the Helena transportation planning process. All motor vehicle accidents that occurred in the City of Helena between January 1, 1988 and December 31, 1990 were considered for that analysis. High-accident locations were identified on the basis of both the accident rate and severity (Robert Peccia and Associates 1992). Table 3.9-3 provides a list of those

TABLE 3.9-1

BASELINE AVERAGE DAILY TRAFFIC COUNTS - POTENTIAL HAUL ROUTES

Alternative	Road	ADT, 1991/1992	ADT, 2010
Site E	Benton Avenue	6,400	9,100
		5,500	7,200
	Custer Avenue	10,700	14,400
		10,900	17,000
		6,800	18,190
		6,000	15,600
		5,500	14,700
	York Road	2,800	9,400
		2,640	7,100
		1,220	3,900
		1,399	2,100
	Lake Helena Drive	328	No data
		247	
	Deal Lane	140	No data
		113	
Site A/CCSS Scenario 1	Benton Avenue	8,100	8,600
	Lyndale Avenue	21,600	25,600
	N. Main Street	15,200	25,600
		12,200	21,100
	Cedar Street	14,300	19,200
		12,800	20,200
	Interstate 15	12,900	27,200
	Highway 12/287	14,700	21,400
		8,500	21,200
		12,590	17,200
	Smelter Road	388	1,500

TABLE 3.9-1 (Cont'd)

Alternative	Road	ADT, 1991/1992	ADT, 2010
Site A/CCSS Scenario 2	Benton Avenue	Same as Scenario 1	
	Lyndale Avenue	21,600	25,600
		13,500	14,100
	Montana Avenue	21,000	21,500
	11th Avenue	13,800	15,700
		14,600	16,600
	Highway 12/287	Same as Scenario 1	
	Smelter Road	Same as Scenario 1	
Site A/CCSS Scenario 3	Benton Avenue	6,400	9,100
		5,500	7,200
	Custer Avenue	10,700	14,400
		10,900	17,000
		6,800	18,190
		6,000	15,600
	Washington Street	4,100	9,800
		- - -	11,200
	Airport Road at I-15	12,800	20,200
	Interstate 15	Same as Scenario 1	
	Highway 12/287	Same as Scenario 1	
	Smelter Road	Same as Scenario 1	
CCSS Landfill	Transfer Station to Highway 12/287	Same as Scenario 1	
	Highway 12/287	Same as Scenario 1	
	Highway 518	1,070	1,800

Sources: Robert Peccia and Associates 1992
Lewis and Clark County Planning Department 1992

TABLE 3.9-2

INTERSECTIONS WITH OBSERVED TRAFFIC CONGESTION PROBLEMS - BASELINE AND PROJECTED DELAYS

INTERSECTION	1991 Peak Hour Delay (Seconds)	1991 Level of Service (LOS)	2010 Projected Delay Peak Hour (Seconds)	2010 Projected Level of Service (LOS)
Site E				
Custer/Montana	15 - 25	C	60+	F
Sites A/CCSS Scenario 1				
Benton/Euclid	40 - 60	E	60+	F
Lyndale/North Main	60+	F	60+	F
Cedar/Montana	60+	F	60+	F
Cedar/Harris	5 - 15	B	15 - 25	C
Sites A/CCSS Scenario 2				
Benton/Euclid	Same as Scenario 1			
Lyndale/North Main	Same as Scenario 1			
Lyndale/Montana	25 - 40	D	60+	F
Montana/Billings	15 - 25	C	15 - 25	C
Montana/Prospect	40 - 60	E	25 - 40	D
Montana/11th	15 - 25	C	25 - 40	D
11th/Roberts	5 - 15	B	15 - 25	C
11th/Sanders	5 - 15	B	40 - 60	E
11th/Lamborn	5 - 15	B	60+	F
11th/Fee	15 - 25	C	60+	F
Site A/CCSS Scenario 3				
Custer/Montana	15 - 25	C	60+	F
Airport Road/I-15	15 - 25	C	25 - 40	D

SOURCE: Robert Peccia and Associates 1992

TABLE 3.9-3

IDENTIFIED HIGH ACCIDENT LOCATIONS

ALTERNATIVE	HIGH ACCIDENT LOCATION
Site E	Custer/McHugh Custer/Montana
Site A/CCSS Scenario 1	Benton/Lyndale Lyndale/North Main North Main/Montana Cedar/Harris Cedar/Interstate 15
Site A/CCSS Scenario 2	Benton/Lyndale Lyndale/North Main Lyndale/Rodney Lyndale/National Lyndale/Montana Montana/Boulder Montana/Townsend Montana/Butte Montana/Prospect Montana/11th 11th/Roberts 11th/Oakes 11th/Lamborn 11th/Fee Highway 12/287/Carter (CCSS Only)
Site A/CCSS Scenario 3	Custer/McHugh Custer/Montana Airport Road/Interstate 15 Highway 12/287/Carter (CCSS Only)

SOURCE: Robert Peccia and Associates 1992

locations. Two high-accident locations (Custer Avenue/McHugh Lane and Custer Avenue/Montana Avenue) were identified along the Site E haul route.

Due to the continental climate of the Helena Valley, severe winter weather can result in large blizzards. At times, snow drifts can form and limit access to various roads in the Helena Valley. According to the Lewis and Clark County Road and Bridge Department, however, there are no significant problems with drifting snow along the Site E haul route. During winter storms, the haul route is plowed two to three times per day to allow access to and from the Warren School (Ellis 1992). Thunderstorm events do occur on occasion, resulting in flooding of portions of the valley and temporarily limiting access on affected roads. The Site E haul route is located in a flood-prone area along a portion of York Road near the Prickly Pear Creek crossing (Ellis 1992).

3.9.2 Site A

For Site A, three alternative haul route scenarios have been identified for consideration. The following discussion provides a description of each haul route.

3.9.2.1 Site A/Scenario 1

This haul route is described as follows (refer to Figure 3.9-1): From the transfer station, trucks would turn south (left) on Benton Avenue and proceed to Lyndale Avenue. The trucks would follow Lyndale Avenue east (left from Benton), turn northeast (left) on North Main Street and continue across Montana Avenue to Cedar Avenue. The trucks would follow Cedar Avenue (east) to Interstate 15, where they would proceed south to U.S. Highway 12/287. The trucks would then follow Highway 12/287 east to Smelter Road, turn south (right) on Smelter Road and proceed to the landfill access road.

The roads along the Site A/Scenario 1 haul route are described in terms of surface type, lane width, and adjacent land use as follows:

- Benton Avenue to the south of the transfer station entrance - a two-lane paved road bordered by Carroll College on the east and residential communities on the west. Foot traffic crosses Benton Avenue at various locations, especially near the college.

- Lyndale Avenue - a busy four-lane paved road that passes along numerous commercial businesses and residential neighborhoods. Carroll College is located to the north of this route.

- North Main Street - a heavily used two-lane paved road that passes a variety of land uses including Memorial Park, vacant areas near the railroad crossing, residential communities, and commercial businesses.

- Cedar Avenue - a heavily used two-lane road that features numerous commercial and some residential land uses.

- Interstate 15 - a modern divided freeway which includes two lanes in each direction that run predominately north/south in the Helena area. Land uses along the highway frontage include commercial, residential, and agricultural/vacant.

- Highway 12/287 heading east from Interstate 15 - a four-lane paved highway that passes a combination of commercial, residential, and agricultural/vacant land uses. Within the City of East Helena, the highway passes rodeo grounds and an industrial area, both located to the south. Numerous residential communities and commercial businesses are located to the north.

- Smelter Road - a two-lane paved road that passes rodeo grounds and the ASARCO Smelter, along with various other industrial sites. A major railroad crossing is found near the junction of Smelter Road with Highway 12/287 in the vicinity of this industrial area. To the south, land use becomes predominantly vacant/agricultural.

As shown in Table 3.9-1, Lyndale Avenue is currently the busiest street along this haul route, although traffic on both North Main St. and Interstate 15 will match the volume projected on Lyndale Avenue in the future. Scenario 1 intersections with identified traffic congestion problems include Benton/Euclid, Lyndale/North Main, Montana/Cedar, and Cedar/Harris. Delay times range from 5 seconds to over 60 seconds at the present time. These delays are projected to remain about the same through 2010. Three of these intersections currently operate below the LOS D threshold, and are not expected to improve. Five high-accident locations were identified along this haul route, and are listed in Table 3.9-3.

Large snow storms probably limit access on various roads along the Scenario 1 haul route for relatively short periods of time, depending on snow plow availability. Smelter Road is considered to have asignificant snow drift problem during the winter months (Ellis 1992). No flood-related problems for this haul route were identified.

3.9.2.2 Site A - Haul Route Scenario 2

Under Scenario 2, the following haul route would be used (refer to Figure 3.9-1): From the transfer station, trucks would turn south (left) on Benton Avenue and proceed to Lyndale Avenue. The trucks would turn east (left) on Lyndale Avenue until Montana Avenue. (Lyndale veers right into Montana on a southerly route.) Montana would be followed (south) to 11th Avenue, where the trucks would turn east (left) and proceed over the Interstate 15 interchange and onto Highway 12/287. The highway would be followed to Smelter Road, from which a right-hand turn (south) would lead to the landfill access road.

The first portion of the route, from the transfer station on Benton Avenue to North Main Street is the same as Scenario 1. From the intersection of Lyndale Avenue and N. Main Street, the route is described as follows:

- Lyndale Avenue - a busy four-lane paved road that passes along numerous commercial businesses and residential neighborhoods. It receives the heaviest vehicle use of any road being considered as a waste haul route. Memorial Park and Kendrick Field are located to the north of this route.

- Montana Avenue - a paved four-lane road that passes numerous commercial and residential land uses. Helena High School is located on the east side of this road.

- 11th Avenue - a heavily used two-lane thoroughfare that passes through a portion of the City of Helena that is characterized by extensive commercial activity. The Capitol Mall is located on the north side of this road.

The last portion of the route, from the junction of 11th Avenue and Highway 12/287 to Site A would be the same as described for Scenario 1 in section 3.9.2.1.

The ADT data indicate that Lyndale and Montana Avenues are now the busiest roadways along this route, and will be in the future. The delays caused by congested intersections are relatively short (primarily in the 5 to 10-second range) at all intersections, with the exception of Benton/Euclid, Lyndale/North Main, and Montana/Prospect (at 60 seconds). The projected increased in delay times for 2010 ranges from 15 to 60 seconds. The Montana/Prospect intersection is the exception, actually decreasing by 2010 (refer to Table 3.9-2). The 14 high-accident locations along the Scenario 2 route are listed in Table 3.9-3.

Large snow storms probably limit access on various roads along the Scenario 2 haul route for short periods of time, depending on snow plow availability. As previously mentioned, Smelter Road is considered to have significant snow drift problems during the winter months.

3.9.2.3 Site A - Haul Route Scenario 3

Under Scenario 3, the following haul route would be used (Figure 3.9-1): From the transfer station, trucks would turn north (right) on Benton Avenue and proceed to Custer Avenue. They would then turn east (right) on Custer Avenue and cross Interstate 15 to Washington Street. They would then turn south (right) on Washington Street and proceed to Airport Road, where they would turn west (right) and cross back over Interstate 15. The trucks would then immediately turn south (left) onto the southbound Interstate 15 on-ramp and proceed to Highway 12/287 and Site A, as described in Scenarios 1 and 2.

Most of the roads along the Scenario 3 haul route were discussed in sections 3.9.1 (Benton and Custer) and 3.9.2 (Interstate 15 to Site A). Washington Street is described below. The first portion of this haul route (from Benton to Airport) is currently used by the City of Helena sludge trucks.

- Washington Street - a paved two-lane road that passes predominantly vacant property between Interstate 15 and the Helena Airport. Washington Street is an important access route for the airport. It is one of only two roads that accesses Skyway Drive and the airport terminal.

The traffic data (Table 3.9-1) indicate that Airport Road, Interstate 15, and Highway 12/287 are currently the busiest roadways along this route, and will continue to be so in the future. Two intersection experience delays due to traffic congestion (Table 3.9-2). Existing delays at Custer/ Montana and Airport/Interstate 15 range from 15 to 25 seconds. They are LOS C during peak hours. In the future, delays at these intersections are expected to increase to 25 to 60 seconds or more, with a LOS D (Airport

Road interchange) to LOS F (Custer/Montana) rating. Three high-accident locations were identified for this route, as listed in Table 3.9-3. Severe weather will be limited to snow drifts, as described above.

3.9.3 CCSS Landfill

For the CCSS Landfill site, the same three scenarios as described for Site A are potential haul routes from the transfer station to Highway 12/287. However, the haul route leading to the CCSS site would follow Highway 12/287 (east) to the City of East Helena and turn south (right) on Highway 518, proceeding approximately 1½ mile to the existing landfill access road. Highway 518 is currently a two-lane paved road that passes through predominantly agricultural/vacant lands. The ASARCO smelter operation, located near the junction of Highway 518 with Highway 12/287, represents the only non-agricultural land use along Highway 518 until the Ash Grove Cement plant is reached near Montana City, about 1½ miles to the southwest. The landfill access road at present is a one-lane dirt road that climbs a moderate grade to the landfill area.

Table 3.9-1 indicates that the only additional roadway in the haul route, Highway 518, currently has a low traffic flow, which will moderately increase to the year 2010. No significant traffic congestion problems were identified for portions of the haul route that are unique to the CCSS site. Traffic hazard locations associated with the CCSS site haul route are the same as those identified for the three Site A scenarios, with the addition of Highway 12/287/Carter. These are shown in Table 3.9-3.

Large snow storms probably limit access on Highway 518 for short periods of time, depending on snow plow availability, since the State Highway Department gives Highway 518 a lower snow plowing priority than Interstate 15 and Highway 12/287. However, there are no significant problems associated with drifting snow along the route (Brewer 1992 and Henderson 1992). No problems associated with flooding were identified for the CCSS Landfill haul route (Henderson 1992).

3.9.4 No Action Alternative

The potential hauling routes of this alternative could include a variety of options that would require accessing major highways departing the Helena Valley. These would include Highway 12/287 east or west and Interstate 15 north or south. The current haul route being utilized for the transport of waste from the Helena Transfer Station to the High Plains Landfill near Great Falls follows the Site A/CCSS Scenario 3 route to Interstate 15. The trucks leave the transfer station, proceed north on Benton Avenue, east on Custer Avenue to Washington Street, south on Washington crossing Airport Road onto the northbound ramp to Interstate 15. Interstate 15 is traveled until Great Falls, when State and local roads are used to proceed to the landfill north of the City.

Most of the roads along this part of Scenerio 3 haul route are discussed in sections 3.9.1 and 3.9.2.3. Three high-accident locations were identified for this route (within the Helena Valley), as listed in Table 3.9-3.

The difference between the other alternatives and the No Action Alternative in the area of transportation would be that the transport of waste would likely be outside of the Helena Valley. The long distance hauling of the area's waste would raise such issues of safety, both the drivers and other highway users, delays due to bad weather conditions, consumption of fuel, and costs. Any highway utilized to leave the Helena Valley has locations that can be potentially hazardous during rainy, windy, snowy, or icy weather conditions (i.e. Wolf Creek Canyon, Boulder Hill, MacDonald Pass, or the Winston-Three Forks road).

3.10 LAND USE AND RECREATION

This section describes the recreational opportunities available to residents and visitors in the near vicinity of the proposed and alternative landfill sites. Information in this section was obtained from maps and literature supplied by public and private agencies, and telephone communications with state agencies such as the Department of Fish, Wildlife, & Parks (DFWP).

In general, the proximity of the sites and their location in the Helena Valley implies that recreational opportunity is very similar. Land uses for the sites are also very similar. Outdoor recreational opportunities in the Helena area center around activities in the Helena National Forest (HNF) and on the lakes in the Missouri River corridor. The HNF is located on both the east and west sides of the Helena Valley, but the area of the HNF east of the Missouri River is the closest to the proposed site. York Road provides access to Forest trails, campgrounds and the Gates of the Mountain Wilderness Area (about 10 miles north of Site E), as well as to the Lakeside resort at Hauser Lake and private residences.

3.10.1 Proposed Action - Site E

There are four lakes in the vicinity of the proposed Site E: Hauser Lake, Lake Helena, Canyon Ferry Lake and the Regulating Reservoir (see Figure 3.3-1). The Montana DFWP manages the recreational facilities and activities occurring at these lakes. Hauser Lake is approximately two miles east of the site; Lake Helena is approximately two miles northwest; Canyon Ferry Lake approximately 7.5 miles to the southwest; and the Regulating Reservoir is about one mile directly south of the site. The primary recreational activities at the lakes include fishing, boating and picnicking. Canyon Ferry State Park also has numerous camping facilities, especially at the north end of the lake, and is one of Montana' s most heavily used state parks, with 200,000 visitors in 1991 (Soderberg 1992). The Black Sandy recreation area on Hauser Lake also offers camping. Private recreational developments are established at Lakeside Resort, including a restaurant, bar and marina.

York Road is used to access the HNF, Hauser Lake and the Regulating Reservoir. To access Lake Helena and the Black Sandy recreation area, recreationists would travel on York Road and Lake Helena Drive. There are two main access routes to Canyon Ferry Lake: one is State Highway 284 and U.S. Highway 12/287, the other Canyon Ferry Road. Residents of Helena and East Helena typically use the Canyon Ferry Road. A golf course is sited near the junction of York Road and Lake Helena Drive, approximately one mile from the southern border of the site. There are no recreational facilities on, or immediately surrounding the site. Some limited hunting could occur on the site, although the proximity of residences makes this unlikely.

The proposed site is undeveloped agricultural land which has, in the past, been dry-land farmed. The area surrounding the site is predominantly agricultural land, including cropland, pasture and rangeland.

Lewis and Clark County has approximately 86,000 acres of cropland. The amount of cropland lost if the entire half-section were taken out of production would be less than 0.5 percent of current cropland acreage.

Other land uses in the surrounding area include limited residential development west of Lake Helena Drive, approximately one-half mile from the western border of the site, and a golf course northwest of the junction of York Road and Lake Helena Drive. A residential development has reportedly received preliminary approval for construction north of the golf course. Two residences are within close proximity to the site. One is situated south of Deal Lane near the northwest corner of the site, the other is north of Deal Lane across from the northeast corner of the site. A utility corridor containing two transmission lines crosses the site. The county does not have any zoning designations for the project area, and, according to the county planning department, development of a landfill in this area would be in compliance with county land use polices (Rasmussen 1992). The site is currently owned by Lewis and Clark County.

Land uses along the travel route from the transfer station to the project area include both residential and commercial uses. Most of the residential areas are in Helena, especially along Benton avenue. Land use along Custer Avenue is a mixture of both residential and commercial areas. Land uses along York Road and Lake Helena Drive are mostly undeveloped or residential. Two schools are located along the route: the Four Georgians School on Custer Avenue in Helena, and the Warren School along York Road.

3.10.2 Site A

The description of recreational facilities and activities given in the introduction to Section 3.10, and regarding use of water resources for recreation, apply to this site as well. There are no recreational facilities on, or immediately adjacent to, the site. A rodeo arena is located just south of East Helena, about one mile north of the project area.

Land at Site A is currently agricultural, mostly grazing and dryland grain farming. A utility corridor crosses the western boundary of the site, Interstate 15 is within one mile of the site to the southwest, and the Smelter Road is directly south and east of the project area. Residential development occurs south of the Smelter Road and on the outskirts of East Helena, both of which are within one to three miles of the site. Industrial and commercial developments also exist within several miles of the site, most notably the ASARCO smelter, located approximately one mile to the northeast.

Site A is in private ownership, and Lewis and Clark County has indicated that the use of this site as a landfill would be in compliance with county land use policies. There are no known plans at this time for any residential developments in the immediate area, although Jefferson County reports that there are plans for residential development in the area bounded by the Smelter Road to the north, Interstate 15 to the west and State Highway 518 on the east, one to two miles south of the site. The travel route to site A would include State Highway 12/287 from Helena to East Helena and the Smelter Road.

3.10.3 CCSS Landfill

The same general description of recreational opportunities in the Helena Valley given in Section 3.10.1 applies to the CCSS site. However, unlike site E, this site is not near any of the major recreational areas of the Helena Valley. State Highway 518 west of the project area can be used to access the Helena National Forest south of the site, but this type of traffic would be minor, compared to the recreational traffic on either York Road or Canyon Ferry Road. There are no recreational facilities on or adjacent to the project area.

The project area is the site is of an existing landfill operation, located in the northern edge of Jefferson County, approximately 1½ miles south of East Helena. Adjacent land uses include agricultural, industrial and residential. The Kleffner Ranch is on the west side of Highway 518, about ½ mile to the west/northwest from the CCSS Landfill. Residential development south of the Kleffner Ranch is approximately ½ mile west of the project area. Residential development is occurring further west, between State Highway 518 and Interstate 15. Industrial uses in the area include the ASARCO smelter (1½ miles northwest), a mining operation (1 mile southwest) and a gravel pit (11/3 mile north).

Jefferson County has in effect an emergency zoning ordinance for an area in northern Jefferson County which includes the CCSS site. The county has indicated that expansion of the landfill would not be within planning goals for that area of the county, and would not be an allowed development under county emergency zoning regulations. The site is reportedly owned by Mr. Ben Sale, but still operated by, and licensed to, City-County Sanitation Service.

The travel route from the transfer station to the site includes portions of Benton Avenue, Lyndale Avenue and 11th Avenue in Helena, and State Highway 12/287 and State Highway 518. There is a mixture of land uses along this corridor, including residential, commercial and industrial.

3.11 VISUAL RESOURCES

This section will identify and describe the visual resources which could be affected by the proposed project. The study area for this resource includes those areas that viewers may travel through, recreate in, or reside in, where existing views may be affected by the proposed or alternative actions. The description of the visual resources of the study area are based on the methodology described in the Bureau of Land Management's Visual Resource Inventory Manual (U.S. Department of the Interior, BLM 1986b).

The visual inventory consists of three factors:

- The scenic quality evaluation involves the rating of the scenic beauty of an area, which is determined by taking into consideration such factors as landform, vegetation, water, color, adjacent scenery, scarcity and cultural modifications. Scenic quality of an area is rated as either class A, B, or C, with class A containing outstanding visual characteristics, class B containing some outstanding scenic features and class C containing features fairly common to the region.

- The sensitivity analysis is a measure of the public's concern for the scenic quality of an area, and is based on factors such as the type of users (commuters, residents, and recreationists), amount of use, public interest and adjacent land use. Sensitivity is rated as either high, medium or low.

- Landscapes are also classified into distance zones based on visibility from travel routes or other possible sensitive viewing locations. There are three distance zones, including the foreground/middleground (0 to 5 mile), background (5 to 15 mile), and a seldom-seen zone (> 15 miles or not seen).

The project area is located in the Helena Valley, which is part of the Northern Rocky Mountains physiographic province (Fenneman 1931). The physiographic area surrounding Helena is characterized by widely spaced mountain ranges separated by broad valleys. Views from the valley floor often include wide panoramas of the surrounding mountains. The mountains west of Helena are not organized into a defined linear range, but are best characterized as a deeply dissected plateau country which includes parts of the Boulder Mountains, and the Garnet and Clark ranges. The Missouri River, and the lakes created by dams on the Missouri, are the dominant water features of the valley. To the east of the Missouri River, the Rocky Mountain front detours to the east to include the Big and Little Belt Mountains. A section of the HNF is located in the Big Belt Mountains, and provides a variety of recreational opportunities.

3.11.1 Proposed Action - Site E

Site E is on flat to gently rolling, treeless terrain about ten miles northeast of Helena and two miles west of Hauser Lake. The land has supported dryland agriculture in the past and, besides a boundary fence and the utility corridor with transmission lines, has no improvements. The surrounding land use is generally agricultural, including cropland, improved pasture and rangeland. Other land uses in the area include limited residential development and recreation. Most of the recreational activities in the area occur in the HNF and on the lakes created by dams on the Missouri river, including Lake Helena, Hauser Lake and Canyon Ferry Lake. Although the site is generally flat, it is located on a topographic divide between Hauser Lake to the east and Lake Helena to the northwest, and has a broad panoramic view of the valley and the surrounding mountains.

The scenic quality of the site is common within the region, typed as Class C. There is little variation in the landform, or in the color, texture, or variety of vegetation. Water features are absent from the site. The only structures on the property are a boundary fence, a utility right-of-way containing two parallel transmission lines, running from southwest to northeast, and the remains of a wood cabin. Overall the site lacks outstanding visual characteristics and has little variety or diversity in any of the landscape elements of line, form, color, or texture.

Distance zones are delineated from travel routes or other possibly sensitive viewing locations such as residences or recreational areas. Lake Helena Drive (located one-half mile west of the site), provides access to recreation areas north of the proposed site, and there are also residences within one mile of the site, which would place the project area in the foreground/middleground zone. The sensitivity of the site is high, based on the number, and sensitivities of potential viewers, including those using the golf course and area lakes.

3.11.2 Site A

Similar to the other sites being evaluated, the landscape of Site A is characteristic of the rural landscapes found within the Helena Valley. The terrain is gently rolling, with vegetation types typical of dryland grain farming and grazing. Without any corresponding changes in vegetation patterns, the topographic diversity of the site is not accentuated. The dominant color of the land is a tawny brown, except for a few months in late spring and early summer when there is enough moisture and plant growth to cover the land in varying shades of green. There are no trees on the site, with little diversity in the overall composition of the landscape scene. To the west and south of the site, the terrain gains in elevation, until it changes to a mountainous landscape within two miles of the site. This adjacent scenery adds to the quality of the views from within the site itself. On the western border of the site there is a utility corridor with twin, parallel transmission lines. This site would also be typed as Class C for scenic quality since features are common to the region.

There are no residences within several miles of the site, placing site A in the foreground/middleground zone. Possible sensitive view locations in the vicinity of the site include Interstate 15, East Helena and residential subdivisions north of East Helena, and residential development to the south of the ASARCO smelter road. Visual sensitivity of the site is medium, based on the number of view locations and type of users, and the adjacent land uses.

3.11.3 CCSS Landfill

The topography of the CCSS site consists of rolling hills, with an abrupt transition to mountainous terrain to the west and southwest, as the valley floor meets the mountains. Landforms of the site have been modified by the operations of the existing landfill. Vegetation on the site and in the immediate surrounding area is homogeneous, with little variation in color or texture. Adjacent scenery somewhat enhances the visual quality of the site, especially views of the mountains to the west and southwest, which contain a mosaic of open grasslands, timber and interesting topographic relief. However, views have also been degraded by a large quarry directly southwest of the site, which dominates the visual attention of the viewer. The viewshed (areas seen from the site) also includes the ASARCO smelters to the north. Overall, the visual quality of the site is common for the region and typed as Class C.

Possible sensitive view locations include travelers and residences along State Highway 518, and residences in East Helena. This would place the site in the foreground/middleground distance zone. The sensitivity rating would be medium, based on the type of users of the area, the amount of use and adjacent land uses.

3.12 SOCIOECONOMICS

The socioeconomic study area for the proposed project is defined as the area that could benefit or suffer impacts from the proposed action or alternative actions. This study area consists primarily of the City of Helena and southern Lewis and Clark County, but also includes the City of East Helena and northern Jefferson County, due to potential project impacts on local government fiscal conditions and the lifestyles of residents. Because East Helena and communities in northern Jefferson County are not committed to using the proposed landfill, potential impact to those jurisdictions relate strictly to the lifestyles and quality of life of residents.

This section describes the general baseline socioeconomic conditions in the Helena Valley and provides more detail on those socioeconomic conditions that are likely to be impacted by the proposed action or alternative actions. Particular attention is given to local government services, fiscal conditions and taxation policies, factors affected by project development and operation costs, and the project demands on local government services. In addition, the attitudes, opinions, and lifestyles of local residents will be discussed, due to potential project impacts on the quality of life in the socioeconomic study area.

The following discussion is based primarily on the Lewis and Clark County Comprehensive Plan (1989), the Helena Urban Transportation Plan (1992), and information provided by the Helena Chamber of Commerce (1992a).

3.12.1 Population and Housing

In 1990, the unincorporated portion of southern Lewis & Clark County had a population of approximately 18,922, Helena had a population of approximately 24,569, and East Helena's population was approximately 1,538. From 1980 to 1990, the County experienced a modest growth rate of 10.4 percent and Helena increased by about 2.6 percent. Population is expected to continue to increase gradually over the next few decades. Unincorporated southern Lewis & Clark County is projected to have approximately 24,274 residents by the year 2000, and 30,400 residents by the year 2010. Helena's population is expected to grow to approximately 25,385 by the year 2000, and 26,318 by the year 2010.

The population of East Helena is expected to remain relatively stable in the future. Projected population growth for Helena and East Helena, and unincorporated southern Lewis & Clark County are depicted on Table 3.12-1. In general, people are drawn to this area due to employment opportunities with the local, state and federal governments, and because Helena serves as a focal point for commercial activity.

Housing is following the general trend of growth in population and urban area. In 1990, there were 18,649 households in Lewis and Clark County. The median value of an owner-occupied house in 1990 was $61,800.

TABLE 3.12-1

PROJECTED POPULATION GROWTH IN THE STUDY AREA

YEAR	HELENA	EAST HELENA	UNINCORPORATED SOUTHERN LEWIS & CLARK COUNTY	TOTAL
1990	24,569	1,538	18,922	45,029
2000	25,385	1,538	24,274	51,197
2010	26,318	1,538	30,400	58,256
TOTAL GROWTH (%)	7.1%	0%	60.6%	29.3%

SOURCE: Robert Peccia and Associates 1992

3.12.2 Local Employment and Economy

Lewis and Clark County has a labor force of 27,293 at present, of which 25,656 are employed. Currently, the Helena Valley unemployment rate is about 6.0 percent. The government sector employs the largest number of workers, roughly 7,950 employees. From 1980 to 1991, employment increased by approximately 12 percent. Services and retail trade are also important employment sectors, second only to government. Major private sector employers in Lewis and Clark County include ASARCO, Blue Cross and Blue Shield of Montana, Carroll College, St. Peter's Community Hospital, K-Mart, Pegasus Gold, Inc., ShopKo, Wal-Mart, and US West Communications. In 1990, per capita income in Lewis and Clark County was approximately $12,342. Table 3.12-2 provides a list of major Helena Valley employers and the number of employees, as compiled by the Helena Chamber of Commerce for 1992.

3.12.3 Government Facilities, Services, and Fiscal Conditions

3.12.3.1 Facilities

The Helena School District has two high schools (2,342 students), two middle schools (1,755 students), and 12 elementary schools (3,662 students). The school district provides special needs programs in many of these schools. Lewis and Clark County also offers 3 private enrollment schools. Helena is home to Carroll College, a liberal arts institution with an enrollment of 1,264 students. Graduate degree courses are available in Helena through the University of Montana and Montana State University. Another significant educational facility is the Helena Vocational Technical Center, which offers programs in various fields, including diesel and aviation mechanics (771 enrolled).

The Helena Airport provides connecting air service to many major U.S. cities, with about 21 scheduled flights each day. Terminal facilities include four car rental agencies, a taxi service, and a diner and cocktail lounge. Other means of transportation include various taxicab services, railroads such as the Burlington Northern and the Montana RailLink, and inter-city bus service.

3.12.3.2 Services

Fire protection services are provided in Helena by the Helena Fire Department, which employs 33 full-time fire fighters. Unincorporated Lewis and Clark County is served by Volunteer Fire Departments, with approximately 500 volunteer firefighters. Law enforcement is maintained by the Helena Police Department and Lewis and Clark County Sheriff's Office, which employ 36 and 25 full-time officers, respectively.

Electricity and natural gas are provided by the Montana Power Company. Water from the Missouri River, Helena Regulating Reservoir, and other sources is provided for residents and businesses by the city of Helena. Residents and businesses located in unincorporated areas generally use well water. Irrigation water usually consists of water diverted from the Missouri River or one of its tributaries, or ground water. Helena at present supplies approximately 13.5 million gallons of water per day to residents and businesses.

TABLE 3.12-2

MAJOR HELENA VALLEY EMPLOYERS

EMPLOYER	NUMBER OF EMPLOYEES
ASARCO	284
Big Sky Care Center	100
Blue Cross and Blue Shield of Montana	453
Carroll College	235
City of Helena	210
County Market	140
Federal Reserve Bank - Helena Branch	110
Helena School District #19	75
K-Mart	150
Lewis and Clark County	250
Montana National Guard	950
Pegasus Gold, Inc.	160
Shodair Childrens' Home and Hospital	105
St. Peter's Community Hospital	680
State Compensation Mutual Insurance Fund	220
State of Montana	4400
US West Communications	450
VA Hospital	411

Source: Helena Area Chamber of Commerce 1992

The Helena wastewater treatment plant treats approximately 3 million gallons per day (gpd) of wastewater. The system has a capacity of roughly 6 million gpd, and therefore will probably meet the needs of the City for many years to come. A substantial portion of the Helena Valley in unincorporated Lewis and Clark County, which is not connected to the central sewer system, relies exclusively on septic systems.

The Scratch Gravel Landfill District is currently responsible for providing solid waste disposal service to residents of portions of unincorporated southern Lewis and Clark County. Solid waste collected within the District is disposed at the Scratch Gravel Landfill, a Class II solid waste disposal facility located northwest of Helena. According to the District, the Scratch Gravel Landfill is projected to close in 1993 due to problems with ground water contamination and lack of additional capacity. The Proposed Action was developed to replace the Scratch Gravel Landfill.

Helena is providing solid waste disposal services for Helena and East Helena residents and businesses (Class II waste) at the Helena Landfill and the Helena Transfer Station, both of which are located on Benton Avenue. This landfill is near capacity also and is currently in the process of completing closure. The wastes collected at the transfer station are currently transported to the High Plains landfill near Great Falls under a short term contract. Helena would also use the proposed project for disposal of solid waste. Similarly, East Helena is disposing its Class III solid waste at its own landfill located near the City. That landfill is expected to be closed in 1994.

3.12.3.3 Fiscal Conditions

The proposed action and alternative landfill actions would require the investment of a large sum of money for site acquisition, landfill construction, landfill operation, and financial assurance for facility closure, post-closure, and contingencies. Section 4.12 describes in more detail the costs and impacts potentially associated with these actions. The fiscal conditions of each of the local government jurisdictions involved with the project are described below with respect to solid waste disposal services and landfill capacities

The Scratch Gravel Landfill District has used a levy system on residential units and commercial businesses for use of the Scratch Gravel facility. The fee is currently $81.60/year for residential units, which does not include waste collection at the generating residence or business. For commercial establishments and large apartment complexes, the solid waste disposal fee is based on the quantity of waste generated with a unit rate of $41.80/ton (Selser 1993).

Helena has required an annual service charge of $116/year of each residential unit to finance its landfill and waste collection program. Apartment complexes with more than four units and commercial establishments are charged a commercial fee, based on the quantity of waste generated, with a unit rate of $50/ton for waste hauled by the generator to the transfer station. A reduced fee of $18.95/year is charged qualifying low income residences (Pallister 1993). East Helena has collected revenue to pay for waste disposal through an monthly fee levied on city residences. That fee is presently $12.25/month, which also includes collection services (Melsten 1993).

The wastes collected at the City of Helena transfer station are being transported to and disposed of at the High Plains landfill under a short term contract with Waste Management of Montana. Inc. This one year contracted was entered into in May, 1993 to provide a disposal option with the closure of the City of Helena landfill due to lack of capacity. The terms of this agreement, which commenced November 1, 1993, requires the City to rent on a monthly basis five (5) transfer trailer (100 to 120 cubic yard capacity) at costs $100.00 each; to pay a transportation rate of $220.00 per trailer load for transporting the wastes to the disposal site; and to pay a fee of $15.95 per ton of solid waste for disposal. These rates are guaranteed until June 30, 1994. The contract has a provision which subject the rates for transportation and disposal to an annual automatic increase based percentage change for the proceeding 12 month period in the Consumer Price Index of the U.S. Department of Labor and Bureau of Labor Statistics. Other provisions provide increases in rates in response to property and fuel tax increases and increases in capital and operating expenditures required by changes in federal, state or local law, rules, ordinances, permit, or permit conditions that were not in effective at effective date of the contract (City of Helena and Waste Management of Montana, Inc. 1993). An example of this type of change would be the Subtitle D regulations that became effective October 9, 1993. The contract has options to renew for one year and then a five year term.

To implement the proposed action, the County would be the primary government entity responsible for acquiring, developing, and operating the proposed landfill. The landfill would be funded through collection of a fee ("tipping" fee) on each ton (or cubic yard) of material disposed at the facility. Each local jurisdiction would be responsible for paying its share of the landfill cost, based on the number of tons of waste contributed multiplied by the tipping fee charged per ton (Johnson 1992a). The costs associated with implementation, the resulting financial impact, and the potential increase in the cost of solid waste disposal service for residents of the study area are discussed in section 4.12.

3.12.4 Quality of Life

The Helena Valley is bordered by mountainous areas and valleys on the east, west, and south, which are primarily public lands managed by the U.S. Forest Service. There are four lakes within close proximity of Helena: Hauser Lake, the Helena Regulating Reservoir, Lake Helena, and Canyon Ferry Reservoir. The environmental and recreational setting of the Helena Valley and project study area no doubt heavily influence the attitudes, opinions, and lifestyles of residents.

Hunting, fishing, hiking, camping and bicycling are popular activities in the mountains during warm-weather months; cross-country skiing and other winter sports are enjoyed by residents in the colder months. The area lakes are relatively undeveloped, accessible and appealing for numerous public recreational uses such as boating, fishing, wading, and swimming. Two of the lakes, Canyon Ferry Reservoir and Hauser Lake, have camping and/or resort facilities available. Lake Helena and the Regulating Reservoir are basically day-use recreational sites. Due to the abundance of recreational opportunities in the local area, and a relatively uncrowded urban setting, the perceived quality of life in the Helena Valley is quite high.

The cost of living in the Helena Valley is low when compared with many other locations in the United States, even western locales. Housing costs in the Helena Valley are roughly 10 percent below the national average, and lower than other western metropolitan areas such as Boise, Casper, Seattle, and Denver. The overall cost of living in the Helena Valley (calculated as the sum of housing, utilities, goods and services, and other miscellaneous costs) is roughly 3 percent below the nation as a whole (Helena Area Chamber of Commerce 1992a).

4.0
ENVIRONMENTAL CONSEQUENCES

This chapter of the EIS provides an evaluation of the anticipated and potential environmental impacts of constructing and operating a landfill. The purpose of this evaluation is to disclose, as completely and methodically as possible, the environmental consequences associated with development of a landfill at each of the alternative sites. These sites include:

- Alternative 1 - Proposed Action, Site E
- Alternative 2 - Site A
- Alternative 3 - CCSS Landfill Site

This chapter does not include a direct environmental impact assessment of Alternative 4 - Modifications to the Proposed Action, because the waste management processes included in that alternative could apply equally to each of the three landfill sites. Where applicable to a specific resource, the impacts of this alternative are discussed.

As described in Chapter 2, the No Action Alternative presents unusual difficulties for the environmental analysis. A No Action alternative implies maintenance of current, baseline environmental conditions. Under this scenario solid waste in the study area would continue to be disposed at the Scratch Gravel and City of Helena transfer station contracted disposal site for the short term future. However, very little capacity remains at the Scratch Gravel facility and the contractual arrangement for disposal of wastes from the Helena transfer station is a short term agreement. Therefore, even in the case of a No Action decision by DHES, some action will be necessary to properly manage the solid waste currently being disposed at these facilities.

Because it is doubtful that a facility expansion at Scratch Gravel and/or the Helena landfill is feasible, or can even be licensed, the most likely No Action alternative scenario would involve refuse disposal at a major solid waste facility outside the study area. Section 2.6.2 described some of the socioeconomic concerns associated with an action of this type. Section 4.12.4 presents a preliminary cost analysis for shipment of solid waste from the study area to a privately operated, licensed Class II landfill in Great Falls. Other environmental impacts for the No Action alternative are not evaluated in this EIS because the Great Falls landfill is outside the study area, and a site-specific environmental analysis could be required. Further detailed analysis of the impacts on a receiving facility for wastes transported out-of-county, such as the High Plains Landfill, is not reasonable within the scope of this EIS since the receiving facility can be transitory.

The environmental analyses presented in this chapter address key evaluation requirements of MEPA and the Administrative Rules of Montana administered by the DHES for the preparation and content of final EISs (ARM 16.2.634). The NEPA and CEQ regulations were also considered for guidance purposes.

Assumptions used in determining impacts are presented at the beginning of each resource discussion, along with a description of evaluation methods and the limits of quantification possible. The following effects have been analyzed for each resource:

- *Primary* - Primary effects are also termed "direct," because they are directly attributable to, and resulting from, an action. A primary environmental effect resulting from operation of a new landfill would be an increase in truck traffic on roads leading to the facility.

- *Secondary* - Secondary effects are also termed "indirect," since they are not a direct result of the proposed action. Using the traffic example above, a secondary effect could be faster deterioration of roads leading to the landfill if haul trucks are overloaded or improperly maintained.

- *Cumulative* - Cumulative effects are often less easy to define and more subjective than primary or secondary effects, because they are dependent not only on effects caused by the proposed action, but also effects resulting from other past or ongoing activities. An assessment of cumulative effects evaluates the combined impact of all relevant actions; reasonably foreseeable future projects should also be considered in the analysis. Again using the example of increased truck traffic, consideration of cumulative effects might reveal that a new industrial plant is planned which would use, as a primary access route, the same roads the landfill haul trucks use. The combined effects of these actions might sufficiently increase traffic such that road improvements and upgrades would be required.

Regulatory requirements to site and operate a landfill at each of the locations are generally discussed, including notation of any potential conflicts with known or proposed regulations or policies. This EIS will evaluate the environmental impacts primarily with respect to both the Subtitle D rules and the revised Montana rules (Table 2.1-1 can be referenced for existing state regulations). Primacy over Subtitle D has been obtained with the state program approval by EPA in December, 1993.

Activities which would require the irreversible or irretrievable commitment of resources are also presented. Methods to mitigate impacts, or in other words to minimize or prevent environmental impacts, are outlined at the end of each resource analysis.

An analysis of the relationship between short-term costs and benefits and long-term resource productivity is provided in section 4.13. Chapter 5.0, Comparison of Alternatives & Preferred Alternative, includes a review of the environmental impacts for each site described in Chapter 4.0, as well as a description of the preferred alternative. Table 5.1-1 in Chapter 5.0 is a quick summary of environmental and socioeconomic impacts.

4.1 SOILS AND GEOLOGY

References used specifically for this section include seismic studies and maps by the U.S. Geological Survey, soil data from the Soil Conservation Service, and the Final EA for the proposed clay-soils mining operation at Site E (Montana DSL 1992).

Subtitle D (Subpart D) design requirements include a maximum 1 x 10^{-7} cm/sec permeability for the engineered soil component of the landfill liner system, which will be overlain by a synthetic material (This is subject to modification, as described in section 2.1.2.). Preferred soil classification and permeability standards for the natural soils beneath Class II landfills include soil types MH, OL, ML, SM, SC, GC, or GM (refer to Table 3.1-1). These soils are fine-grained and have low permeabilities (1 x 10^{-3} to 1 x 10^{-6} cm/sec. The objective of finding a site that meets these permeability goals is to prohibit or minimize leachate migration from landfills.

Solid waste disposal permanently alters the nature of soils and possibly subsurface materials, depending on the degree of contact between the refuse and underlying lithologies. Due to the cool, semi-arid climate in the study area, biological degradation of refuse is relatively slow. In other words, it takes longer for solid waste to decompose to organic material in Montana than in warm, wet climates. These same climactic conditions also result in a slower rate of leachate and methane production in Montana landfills.

Impacts to the various soil types will occur at all three alternative sites during the construction phase, both in terms of soil alteration and soil disturbance and availability. As soil is removed and stockpiled for landfill cover, it will be subject to short-term wind and water erosion. No major stream bank soils are located on any of the three proposed sites. Any new road construction or expansion of existing roads will impact soils and potentially be a source of erosion. Impacts will be described for individual soil types and their inherent slopes; permeabilities, compaction, and drainage characteristics will be detailed for each site.

Federal and state landfill siting requirements governing local geology are included in Subpart B of Subtitle D. Subpart B relates to fault areas, seismic impact zones, and unstable areas. A detailed discussion of these federal and state requirements is provided below. Subsequent sections include a description of how they impact the three landfill site alternatives.

- Fault Area - Subpart B requires that new landfills "not be located within 200 feet of a fault that has had displacement in Holocene time." This translates to a 200-foot separation distance from a fault that has moved within the last 10,000 years. In states with approved permit programs, the site may fall within this zone providing that the structural integrity of containment systems (liners, leachate collection, and surface water control) and protection of human health can be demonstrated for a shorter setback distance.

- Seismic Impact Zone - Subpart B also states that new landfills cannot be located within a "seismic impact zone," which is an area having a 10 percent or greater probability of horizontal acceleration in hard rock exceeding 0.10 g in 250 years. (The unit "g" is expressed as a percentage of the earth's gravitational pull.) A seismic impact zone may be thought of as an area with higher probability of earthquakes and ground movement. As noted in section 3.1.4, Lewis & Clark County is located within a seismic impact zone. Landfills in states with approved permit programs can be sited within such a zone providing that containment structures are "designed to resist the maximum horizontal acceleration in lithified earth material for the site."

- Unstable areas - These are defined as areas "susceptible to natural or human-induced events or forces capable of impairing the integrity of some or all of the landfill structural components." Examples of unstable areas include karst terrains (a geologic landform characterized by caves or solution cavities), landslides, or other catastrophic mass wasting events. Subpart B requires that all landfills must include engineering measures that ensure structural integrity of the containment systems.

Similar to the Subtitle D and state design requirements described previously, these siting rules impact new landfills as of October 1993. Additionally, the unstable area criterion will apply to existing landfills over the next three years (refer to section 2.1.2).

4.1.1 Proposed Action - Site E

Subsurface materials at Site E are predominately older stream and lake deposits which form terraces and fan deposits. These materials contain volcanic ash and rock fragments, which weather to highly plastic clays.

4.1.1.1 Direct and Indirect Effects

Overall, the Site E soils are classified as SC and CL with low permeabilities (2.1×10^{-5} to 8.8×10^{-7} cm/sec), which is desirable for use in landfill construction and cover. The lower the permeability of the liner material, the less potential there is for water to percolate through pore spaces and into underlying groundwater resources.

Coarser sand and gravel lenses, which are more permeable than those soils described above, also occur in this area. Sand and gravel lenses can retain water and represent confined aquifers at sufficient depths. These high-permeability zones are less desirable because contaminants in water are more mobile and are not as likely to be retained or adsorbed onto soil particles.

Based on the results of a soil balance calculation completed for the proposed landfill area of 80 acres at Site E (Damschen & Associates 1990a), it appears there will be sufficient quantity of soil available for both daily and final cover application. Approximately 4.8 million CY of soil will be excavated during the life of the facility. Of this volume, roughly 1.1 million CY will be needed for daily cover and 230,000 to 390,000 CY will be needed for a final cover system. (The range of final cover soil volumes reflects the fact that a Subtitle D cover will include a minimum of 18 inches of compacted, low permeability soil overlain by a geosynthetic fabric, as opposed to the 36-inch soil cover specified in the license application.) Some of the remaining soil will likely be used for site grading and surface water control. An additional soil requirement in the landfill development is a 2-foot soil component in the liner system. In accordance with Subtitle D, this layer must be compacted to a maximum permeability of 1×10^{-7} cm/sec. As most of the on-site soils appear to have a permeability that is slightly greater, it is possible that off-site soils will need to be imported for mixture with on-site material to create the required permeability. The volume of soil needed for the liner system may be 390,000 CY. Overall, there would be expected to be a positive soil balance (surplus) at Site E.

Minor uranium occurrences were noted at four areas in the Helena and Townsend Valleys by Becraft (1958). One of the areas is in Sections 27, 28, and 29, T. 11 N., R. 2 W., M. P. M., north of Site E. The uranium was leached from water lain volcanic ash, now represented by clay and bentonite, and preferentially concentrated by the carbon in a few discontinuous thin shaley beds. The slightly radioactive shales range from one inch to one foot in thickness. These beds project on dip beneath the proposed landfill at Site E. A re-examination of the drill logs from borings at the property indicated that these beds may be present beneath the landfill at depths below proposed depths of excavation. The proposed landfill at Site E is located in the uranium depleted clays above the shales. The beds potentially containing trace amounts of uranium below the proposed landfill pose no greater threats to persons at the landfill than living in the volcanic and granitic terrains that comprise much of this part of Montana.

Indirect effects include the significant low-permeability on-site soils. These are not suitable for road construction. In addition, erosion due to the construction of both the landfill and access roads is expected, as is topographical alteration due to removal and stockpiling of soils. These effects can be minimized by erosion control measures, such as moderate slopes and use of straw bales or silt fences.

The proposed landfill at Site E will not be appreciably impacted by existing geology. Site E is not located within 200 feet of any known fault which has been active within the past 10,000 years, thus satisfying Subtitle D criteria. Surface expressions of the nearest faults, the Spokane Bench and Regulating Reservoir Faults, are over 1/2 mile from Site E, and there is no evidence of activity since late Tertiary to Pleistocene eras (over 10,000 years ago). This site is within a seismic impact zone, however. Based on USGS determinations of probabilities for earthquakes and ground movements, Site E has a 10 percent probability of exceeding the maximum seismic acceleration of 0.40 g in 250 years (Algermission et al. 1990). It is uncertain whether the proposed containment structures for Site E have been designed to resist a horizontal acceleration of 0.40 g. If not, it is expected that the design would be upgraded to meet this engineering criterion. Finally, based on the landforms, surface and subsurface materials and topographic relief, no unstable areas are present at Site E. Available maps, literature, and site visits indicate no evidence of either landslides or mass wasting. The density and low compressibility of subsurface materials tend to eliminate the potential for major differential settling/compaction.

4.1.1.2 Regulatory Requirements

No known conflicts with federal or state rules would occur at Site E. The design for landfill development at Site E, as assessed through a review of the Phase 2 Siting Study, License Application, the Environmental Assessment, and the revised liner design for cells 1 and 2 currently includes a modified composite liner, leachate collection, and surface water control. It is expected that this design which upgraded the original design to comply with Subtitle D (and the final state regulations) will provide additional ground and surface water protection. A revised final cover system design, including a barrier layer of similar design as the bottom liner (a minimum of 18 inches of soil at 1×10^{-6} cm/sec and a geosynthetic) and an erosion layer (6 inches of topsoil), would also be needed. Soil and geological conditions at Site E would meet regulatory requirements, with the exception of seismicity, which would be mitigated with the appropriate engineering protection.

4.1.1.3 Irreversible or Irretrievable Commitment of Resources

There are no irreversible or irretrievable commitments of soil or geological resources as a result of constructing a landfill at Site E. No unique soil resources would be eliminated. The proposed landfill would have no adverse effect on geologic resources, as no minable commodities such as mineral deposits, oil and gas, and/or coal underlie the site. The radioactive anomalies noted by Becraft (1958) in the vicinity of Site E probably represent uranium concentrations much too low to warrant extraction.

Some forms of future land use, especially those involving excavation or intrusion into the subsurface, may be prohibited at a closed landfill because of methane gas or to prevent contaminant release. However, closed landfills have been used in a variety of ways, including agricultural, stock grazing, and even recreational development (such as golf courses and ski areas).

4.1.1.4 Cumulative Impacts

An EA was completed for open-cut mining operations on the proposed Site E landfill (Montana DSL 1992). It occupies about 5.4 acres of county-owned land in the NE¼ of the NE¼ of Section 32, which is within the proposed Lewis & Clark County landfill at this site. The proposal was to mine 40,000 CY of clay borrow material, to be used to cap the existing Scratch Gravel and City of Helena landfills. This activity first involved removing and stockpiling 24 inches of topsoil (about 17,000 CY), which would be replaced and seeded with grasses and forbs following excavation of the borrow material. An access road connecting the borrow area with Deal Lane has been constructed. The operation would be completed in approximately 14 months. It was assumed in the EA that the clay mine would be operated and closed prior to construction of the landfill. Excavation of this soil would not have appreciable impact on the soil balance for on-going cover and closure operations, as calculated in section 4.1.1.1.

DSL determined that impacts due to the clay mine would be minimal, mainly in the form of short-term, localized surface disturbance. Assuming Site E is licensed as a landfill, reclamation of the mine would need to be coordinated with proposed landfilling activities. According to DSL's assessment, "excavation of the proposed landfill would obliterate the excavation of the proposed clay mine in terms of both area and depth." It is not expected that the removal of 40,000 CY of clay borrow material would contribute to a shortfall in suitable landfill liner or cap materials.

4.1.1.5 Potential Mitigation Measures

The proposed low-permeability liner will minimize impacts to subsurface resources. Implementation of an effective construction quality assurance (CQA) program will also ensure that liner materials and installation meet specifications. Additionally, the landfill containment structures must be built to withstand conditions within a seismic impact zone.

Runoff control measures, such as retention basins and diversion ditches, will be implemented to reduce erosion and soil loss. Maintenance of soil stockpiles at a 3:1 slope would also minimize erosion. If steeper stockpiles are needed, stabilization materials such as netting can be placed over the soil.

4.1.2 Site A

Test pits were developed at Site A during the siting studies, but boreholes were not completed. A single borehole of approximately 100 feet was drilled during preparation of this EIS to obtain more information specific to the site.

Site A is generally gently sloping terrain, on uplands and alluvial fan terraces. Soils are complex, and range from gravelly loams, silty/clayey sands, and gravelly clays. These materials include volcanic ash. Overall, the surface and near surface materials are relatively low permeability (2.5×10^{-5} cm/sec).

4.1.2.1 Direct and Indirect Effects

Erosion due to the construction of both the landfill and access roads is expected, as is topographical alteration due to removal and stockpiling of soils. Erosion is expected to result from the disturbance of relatively small areas at any given time (approximately three to five acres). As noted previously, moderate slopes and sediment-retaining structures will mitigate erosion. Wind erosion can be minimized by the use of water or other dust suppressant.

As described in section 2.3.2, due to the ravine-type topography it is not expected that as much earthwork will be required for landfill development at Site A as at Site E. Therefore, significantly less than the 4.8 million CY excavated from Site E may be available at this location for liner and cover material. Assuming a design which includes both a composite liner and final cover system to comply with Subtitle D (and pertinent state regulations), the soil requirements for the 80-acre Site A are expected to be the same as for Site E. During the life of the facility, roughly 390,000 CY would be needed for liner installation, 1.1 million CY for daily cover, and 230,000 CY for the final cover system. Therefore, the total soil requirement is approximately 2.5 million CY, which may be close to the volume of excavated material. A more definitive soil balance cannot be evaluated until a design has been completed. It should also be noted that, as with Site E, the permeability of on-site soils may not be entirely suitable for the liner system without amendment.

Similar to Site E, geological impacts on a landfill at Site A are expected to be minimal. There is no known recently active fault within 200 feet of the site,. (An inferred trace of the Bald Butte Fault is about 1,500 feet south of Site A, but it is a strike-slip fault with primarily horizontal movement that occurred an estimated 38 million years ago.) However, Site A is within the same seismic impact zone as Site E, and the design requirements required for a Site E facility would also apply to this site. Finally, based on the landforms, information regarding surface and subsurface materials, and topographic relief, Site A is not located within an unstable area. No evidence of landslides or mass material wasting is visible.

4.1.2.2 Regulatory Requirements

Applicable regulatory requirements were discussed in section 4.1.1.2. The design of a landfill and associated containment structures for Site A has not been developed. Based on the Subtitle D regulations, it is expected that such a design would be similar to that developed for Site E, and include a composite liner system, leachate collection, surface water control and ultimately a composite final cover system. This design would be required to comply with Subtitle D (and pertinent state) regulations in order to be licensed.

4.1.2.3 Irreversible or Irretrievable Commitment of Resources

The commitment of quality resources are the same as those discussed in section 4.1.1.3.

4.1.2.4 Cumulative Impacts

No cumulative impacts are clearly identified since there are no other actions occurring in the vicinity of this site which, in combination with the impacts described earlier, would result in greater or lesser impacts to soils and lithologic resources.

4.1.2.5 Potential Mitigation Measures

Applicable mitigation measures are the same as those discussed in section 4.1.1.5.

4.1.3 CCSS Landfill

This site is identified by the existing landfill operation located in the eastern one-third of the property. A landfill expansion would be constructed to the immediate west of the existing operations, in the "middle" third of the parcel. The entire 60-acre parcel has been licensed for landfilling. The impacts evaluation for this area and the rest of the CCSS site has been limited by the highly variable nature of surface materials present and the absence of site-specific permeability data.

The CCSS site is gently to moderately sloping terrain, and most of the surface materials present are glacial tills. These tills are typically sands and gravels, which would yield high permeabilities. Subsurface soils found on site range from sands and gravels through silts and clays in various stratigraphic layers.

4.1.3.1 Direct and Indirect Effects

Previous calculations indicate that CCSS landfill operations will require approximately 50,000 CY of soil annually for daily and final cover. For a facility lifespan projected at 62 years (Tenneson Landfill 1992) this equates to about 3 million CY. While it is likely that cover materials requirements will be met by excavation activities, the on-site soil permeabilities may not be low enough for a liner system with a permeability criterion of 1×10^{-7} cm/sec. Off-site soil or amendment may be necessary. The liner soil volume will range from roughly 290,000 CY (for a 2-foot layer to be overlain by a geosynthetic) to 580,000 CY (for the 4-foot layer suggested in the 1992 Development Plan).

Although not as significant as at Sites E and A, some additional erosion due to construction of a landfill expansion and access roads is expected. Further topographical alteration will also occur due to removal and stockpiling of soils.

Similar to the previous sites, geological impacts at an expanded landfill at the CCSS site are expected to be minimal. The site is not within an active fault area. The trace of the Bald Butte Fault is inferred to bisect the CCSS area, but it is poorly defined and there is no evidence of any movement during the past 10,000 years. No site-specific data are available regarding seismic risk. However, based on published

USGS maps, seismicity at CCSS is very similar to the other two sites. Therefore, the same engineering requirements that were required for Sites E and A would apply. Lastly, based on landforms, information regarding surface and subsurface materials, and topographic relief, it appears that the CCSS site is not located within an unstable area.

4.1.3.2 Regulatory Requirements

Applicable regulatory requirements are as discussed in section 4.1.2.2.

4.1.3.3 Irreversible or Irretrievable Commitment of Resources

The commitment of quality resources are as discussed in section 4.1.1.3.

4.1.3.4 Cumulative Impacts

Impacts to soils and geologic resources at CCSS are similar to those discussed in section 4.1.2.4 for Site A. It is expected that the existing landfill will require upgrades to comply with Subtitle D, regardless of an expansion to accommodate future disposal of Lewis & Clark County waste. Operational changes will also occur as a result of accepting an additional 40,000 TPY. On-site borrow materials for roads, and the liner and cover system, would be extracted at a much faster rate than is currently observed.

A thick gravel zone is located near the surface in the northwestern part of the site. This material may have some economic potential as aggregate material and should be considered in site planning.

No other actions are occurring in the vicinity of this alternative site which, in combination with the impacts described earlier, would result in greater or lesser impacts to soils and lithologic resources.

4.1.3.5 Potential Mitigation Measures

The mitigation measures described in section 4.1.3.5 are applicable to this site as well. However, only a preliminary design of a landfill expansion and associated containment structures for the CCSS Landfill site has been developed. It is expected that this design would be upgraded to include a Subtitle D composite liner system, in addition to leachate collection and surface water control.

4.2 GROUND WATER

Impacts to the ground water system at the three alternative landfills sites were analyzed with respect to the federal and state landfill regulations discussed in section 2.1.2. References used specifically for this section include the most recent work plan for the CCSS Landfill (Schafer & Associates 1992), the draft of the latest hydrogeologic assessment for the CCSS Landfill (Gallagher 1993), the report of field activities at Site A (Montana DHES 1993) and the various siting studies conducted for Site E.

4.2.1 Proposed Action - Site E

The nearest private well, believed to be downgradient from Site E, is located approximately 1,200 feet to the northeast of the landfill. A private well to the northwest from Site E is closer (less than 500 feet), but is believed to be upgradient from the site. The locations of on-site wells and borings were shown in Figure 3.2-1.

4.2.1.1 Direct and Indirect Effects

The current design for landfill development at Site E indicates that excavation of the waste cells will extend to a depth of approximately 41 feet bgs (refer to section 2.1.5.1). As ground water in the area was encountered at 81 feet bgs and deeper, construction of the landfill is not expected to directly affect the ground water system.

No direct ground water effects are anticipated. However, if leachate were to penetrate the liner system, it could migrate to the ground water system and move in a downgradient direction. Ground water quality deterioration could occur. Continued migration could potentially impact private wells or springs downgradient. Mitigation to reduce this possibility is discussed below.

Potential indirect effects to the ground water system could result from the construction equipment used in landfill development. Fluids used to power, clean, and maintain this equipment, such as gasoline, diesel, lubricating oils and solvents, have the potential to leak or spill. Precautionary measures, such as tanks with secondary containment for controlled storage, can be implemented. Additionally, construction vehicle accidents may cause spillage or leakage. Spills and leaks would most likely be localized and easily contained and cleaned up, however, resulting in minimal impact to ground water resources.

The most serious potential impact to the ground water resource would occur if leachate from the disposal areas were to escape the containment structures constructed to prevent that possible release. If leachate was to penetrate or leak from the liner system it would have to move through the fine grain subsurface soils of the site until it potentially migrated to sand and gravel lenses or encountered the aquifer beneath the site. The liquid leachate passage through the silts and clay particles of soil beneath the site would have some attenuating affect on the level of contamination, but would allow movement of the liquid if there were sufficient quantities to cause saturated conditions. If the liquid leachate were to encounter a sand and gravel lens, movement would be greatly increased, however it is unknown if the lenses of these materials are connected with each other or with the ground water aquifer at depth beneath the site. Should leachate potentially enter the ground water beneath the site, the contaminated water would move with the water in a downgradient direction. The ground water monitoring required at all landfills is designed to detect contamination of ground water at this point before that water moves beyond the property boundaries of the landfill facility. If ground water contamination is detected by the monitoring system, corrective action or cleanup activities are required under Subtitle D and state rules.

4.2.1.2 Regulatory Requirements

A discussion of applicable regulations was provided in section 2.1.2. No known conflicts with federal or state regulations would exist as a result of landfill development at Site E. Subpart E of Subtitle D ground water monitoring requirements would be met. Compliance with Subparts C and F would also protect ground water resources. These require waste screening to divert hazardous wastes and liquids, and closure with a low permeability cover system, respectively.

4.2.1.3 Irreversible or Irretrievable Commitment of Resources

If contamination of ground water were to occur, there could be an irreversible or irretrievable commitment of resources. Attempts to remediate contaminated ground water to drinking water standards (if required) can be costly, time-consuming and are not always successful. Despite sound engineering design developed to protect ground water resources, the potential always exists for ground water contamination to occur. This potential exists, to greater or lesser extent, at all of the landfill sites considered. Ground water contamination could result in a lost, or at least damaged, resource. Mitigation measures are included below.

4.2.1.4 Cumulative Impacts

The current landfill design does not call for extensive use of ground water resources, so no discernable additive impact on the quantity of ground water available for other area users should occur. Water quality impacts are discussed in section 4.2.1.1. No measurable cumulative effect is anticipated.

4.2.1.5 Potential Mitigation Measures

The design for landfill development at Site E (refer to section 2.2) currently includes a composite liner, leachate collection system, and surface water controls. The implementation of leachate level monitoring would allow leachate to be removed from the landfill at a frequency that matches accumulation. Leachate quality monitoring should provide information on the impacts resulting from a leak in the liner system. A ground water monitoring program would also serve as a warning system to detect any impacts to the ground water. It is also required that ground water monitoring efforts would include comprehensive sampling and analysis of ground water quality that complies with Subtitle D (refer to section 2.1.2) and Montana Rules for Ground Water Monitoring at Landfills.

Mitigation measures should also include clear, uniform procedures for the detection and prevention of the disposal of regulated quantities of hazardous waste, PCB waste, and bulk or non-containerized liquid waste as required by Subtitle D (Subpart C). In compliance with Subpart F, landfill closure would consist of a final cover of low-permeability soils and a synthetic barrier to minimize infiltration and erosion. Required post-closure activities include continued ground water monitoring and operation and maintenance of the leachate collection system for a period of 30 years after closure construction.

4.2.2 Site A

One boring was installed at Site A during EIS preparation to obtain site specific information on the site subsurface geology and ground water resources. DHES prepared an report on the results of this effort, which included discussion of ground water characteristics in the vicinity of Site A, as understood from other studies and well log information (Montana DHES 1993).

A design for landfill containment structures at Site A has not been developed. It is expected that such a design would be similar to that developed for Site E, but at least include a liner system which meets Subtitle D (and pertinent state regulations), in addition to leachate collection and surface water control. Also, a ground water plan similar to that described in section 2.2.4 would be required.

4.2.2.1 Direct and Indirect Effects

Ground water in the vicinity of Site A was encountered at 85 feet bgs and deeper. Construction activities, including excavation for trenches, would not directly impact ground water resources. Assuming compliance with Subtitle D, and based on the presence of some low permeability materials with depth at Site A, ground water contamination is not likely from the landfill. The potential for other effects would be similar to those described in section 4.2.1.1.

The direction of ground water flow at Site A is most likely toward the north/northeast. A potentiometric surface map prepared for the Site A field investigation report indicates ground water contamination would flow from Site A in the direction of the ASARCO Smelter (Montana DHES 1993). There are no private wells in the presumed downgradient direction prior to the Smelter.

Site A is located near the southern border of the Helena valley-fill aquifer recharge zone. The U.S. Geological Survey study of the hydrogeology of this system concluded that the "aquifer system is relatively susceptible to potential contamination from surface or near-surface sources..," and that conditions most favorable to aquifer contamination "...generally exist in the southern and western parts of the aquifer" (Briar and Madison 1992). However, a site-specific conclusion would be based on the local geologic conditions and ground water flow gradient. Although Site A is apparently underlain to some extent by low permeability materials, additional subsurface characterization would be needed to draw confident conclusions.

4.2.2.2 Regulatory Requirements

Additional regulatory requirements were discussed in section 4.2.1.2.

4.2.2.3 Irreversible or Irretrievable Commitment of Resources

The commitment of quality resources is as discussed in section 4.2.1.3.

4.2.2.4 Cumulative Impacts

Applicable cumulative impacts were discussed in section 4.2.1.4.

4.2.2.5 Potential Mitigation Measures

Applicable mitigation measures are as discussed in section 4.2.1.5.

4.2.3 CCSS Landfill

4.2.3.1 Direct and Indirect Effects

Expansion of the existing CCSS Landfill operation would most likely consist of the excavation of trenches 20 to 30 feet deep and 60 feet wide. Ground water in the vicinity of the proposed landfill is found at depths ranging from approximately 70 to 180 feet bgs across the site. Therefore, excavation of the landfill cells should not encounter any water-bearing zones.

Potential impacts to the ground water system would be similar to those described in section 4.2.1.1. However, soils and underlying lithologies at the CCSS Site are likely to have a lower capacity to inhibit the downward migration of leachate. In other words, if a leak were to develop in the liner system, leachate could migrate to the underlying ground water resources faster than at Site A or Site E.

The Kleffner Ranch is located west/northwest of the landfill. Water quality at this residence could be susceptible if ground water flow from the CCSS Site is influenced by lithologic contacts, fractures or jointing. However, the direction of ground water flow at the CCSS Site more likely follows regional trends, toward the north/northwest in the direction of flow of Prickly Pear Creek. If this is the case no private wells are directly downgradient from the CCSS Site, prior to the ASARCO Smelter.

The CCSS facility is located near the southern border of the Helena valley-fill aquifer recharge zone. The U.S. Geological Survey study of the hydrogeology of this system concluded that the "aquifer system is relatively susceptible to potential contamination from surface or near-surface sources..," and that conditions most favorable to aquifer contamination "...generally exist in the southern and western parts of the aquifer" (Briar and Madison 1992). However, a site-specific conclusion regarding susceptibility to contamination would be based on the local geologic conditions and ground water flow gradient. Additional subsurface characterization would be needed to draw confident conclusions about local ground water conditions.

4.2.3.2 Regulatory Requirements

A preliminary design for an expanded landfill or associated containment structures at the CCSS Landfill has been developed which includes provision for a 4-foot-thick clay liner and a leachate collection system (Tenneson Landfill 1992). Based on recent public communication regarding plans for the CCSS facility, it is anticipated that this design would be upgraded to include a composite liner system as well. Also, the existing ground water monitoring plan would require revisions similar to those described in section 4.2.1.1. When finalized, the design and monitoring plans would have to comply with the Subtitle D and state regulations for licensing. Details of the revisions to the current monitoring plan were described in the CCSS Landfill draft hydrogeologic assessment (Gallagher 1993).

Additional regulatory requirements were discussed in section 4.2.1.2.

4.2.3.3 Irreversible or Irretrievable Commitment of Resources

The commitment of quality resources is as discussed in section 4.2.1.3.

4.2.3.4 Cumulative Impacts

Applicable cumulative impacts are as discussed in section 4.2.1.4.

4.2.3.5 Potential Mitigation Measures

Applicable mitigation measures are as discussed in section 4.2.1.5.

4.3 SURFACE WATER

This section addresses surface water resources, including surface water runon and runoff, as it relates to landfill operations. "Runon" is presumably clean (uncontaminated) water that flows onto the area where active landfilling is occurring (a cell accepting waste and not protected with a final cover system). The runon may then become contaminated and require special handling. Runon volume can be minimized by constructing earthen berms or intercepting drainages that divert the flow away from and around the landfill. "Runoff" flows from the landfill to downgradient areas. Depending on the point of generation, runoff can be clean (from a cell not yet accepting waste or one closed with a final cover, or in an off-site area) or contaminated (from an active cell). Clean runoff can be allowed to drain from the site uncontrolled with the exception of erosion and sediment transport mitigation measures. Contaminated runoff must be contained and managed in a manner that complies with stormwater discharge regulations and prevents pollution of other waters.

Due to the uplands location of Site E and the CCSS Landfill, runon is not expected to be significant. Therefore, infiltration into the landfill and ponding on the surface is not a great concern. Site A would be constructed in a natural drainage channel and slopes leading into the drainage would direct runon water toward waste cells. Diversion structures would be necessary to prevent or minimize runon at Site A. Runoff of contaminated surface water would require control at all sites, however.

Landfill construction, operation, and closure may therefore affect surface water drainage patterns and runoff regimes. Excessive surface water runoff can erode soils and transport sediment and wastes to downgradient areas. Landfills within the 100-year floodplain can limit flow within the floodplain and cause potential washout of solid waste from the landfill. Landfills located near wetlands can adversely affect wetlands if pollution control devices are not designed adequately. Floodplains and wetlands, which are regulated by Subtitle D (Subpart B) and the revised state regulations, are discussed below.

- Floodplains - Neither new, expanded, or existing landfills can "restrict the flow of the 100-year floodplain, reduce water storage capacity, or result in a washout of solid waste which poses a hazard to human health and the environment." A floodplain is defined as the lowland and relatively flat area adjoining inland and coastal water covered by the 100-year flood, which is the standard used to identify floodplains with special hazards. Special flood hazards areas are defined as having a one percent or greater probability of being equaled or exceeded during any given year. Montana rules prohibit the establishment of solid waste management facilities in 100 year floodplains.

- Wetlands - Neither new or expanded landfills can be located within a wetlands area. In states with approved license programs (refer to section 2.1.2), a landfill can be sited within a wetlands providing that it can be demonstrated that the facility will not violate the Clean Water Act or state wetlands and water quality laws. However, Montana rules would prohibit landfill placement in wetlands.

This section also includes a discussion of the impacts caused by the Modification to the Proposed Action, since alternative waste handling and management actions could result in effluent discharge. References used in this section include the ASARCO RI/FS report (Hydrometrics 1990), Flood Insurance Maps generated by the Federal Emergency Management Agency, and the USGS Water Supply Paper 3275 - Floods and Droughts.

4.3.1 Proposed Action - Site E

The existence of shallow domestic wells, completed in perched zones east of Site E, and surface water drainages to the west suggest that containment of contaminated surface water runoff from the landfill site is critical. Surface runoff to the east and west will be retained in two sediment retention basins, to be constructed in the two small draws on landfill property. The western basin has a design capacity of 265,000 cubic feet (ft^3) of water and therefore will be capable of handling a runoff potential of 226,000 ft^3 (1.69×10^6 gallons), which is equivalent to the 25-year/24 hour precipitation event. The eastern basin is designed with a capacity of 140,000 ft^3 and the 25-year 24 hour precipitation event runoff is calculated to be 113,000 ft^3 (8.45×10^5 gallons).

4.3.1.1 Direct and Indirect Effects

Site E is located outside the 100-year floodplain, and is not located in an area defined as a wetlands. Therefore, there are no floodplain or wetland restrictions for this site. The main impacts to surface water resources for a landfill at Site E are runoff, runon, and potential for contamination of nearby irrigation canals (approximately 1,000 feet east of the site), springs (approximately 3,000 feet east of the site), ponds, marshy areas, and Cedar Creek. Springs in section 33 and 34 (east of Site E) are reported (Chen-Northern 1990c) to be intermittent and recharged by irrigation canals, although field surveys conducted in support of this EIS in December of 1992, April and November of 1993, indicated a heavy discharge from one or more springs in this area. Assuming mitigation measures are taken, the quality of these sources should not be adversely impacted (see sections 4.2.1.5 and 4.3.1.5).

4.3.1.2 Regulatory Requirements

No known regulatory conflicts with applicable federal or state rules would occur. In addition to the Subpart B location criteria of Subtitle D, it is expected that landfill operations at Site E would comply with Subpart C, or the operating criteria of the federal rules. This subpart requires all landfills to have both runon control for the peak discharge of a 25-year storm and runoff containment of the 24-hour/25-year storm event. Runoff must subsequently be managed to prevent contamination of waters of the state. The existing Site E runoff control plan complies with the runoff control requirements. It is expected that appropriate runon control would be established. A stormwater management plan would also need to be developed and approved by the DHES Water Quality Bureau. Additionally, a Subtitle D (and pertinent state) final cover system would be required.

4.3.1.3 Irreversible or Irretrievable Commitment of Resources

There is no irreversible or irretrievable commitments of surface water resources as a result of constructing a landfill at Site E.

4.3.1.4 Cumulative Impacts

Lewis & Clark County's action of mining borrow material from Site E will require the mining operations in the northern portion of section 32 to be coordinated with landfill operations, depending on the timing for the construction of the proposed landfill (Montana DSL 1992). The focus of this coordination would be to reduce adverse impacts to surface water, and control runon and runoff through the use of collections systems, retention basins, or diversion ditches. No other cumulative impacts are known.

4.3.1.5 Potential Mitigation Measures

According to the EA prepared for Site E, the proposed runoff retention basins would minimize pollution of waters of the state (Montana DHES 1991). Diversion ditches, which are included in the landfill design for Site E, will divert runon from open areas of the landfill. Other mitigation measures include confining active operations to only a small portion (approximately 10 percent) of the landfill at any given time. This would minimize the amount of contaminated runoff, as well as leachate production (from precipitation that does not drain from the site, but percolates down through the wastes contained in the landfill).

4.3.2 Site A

No surface water quality data are available for Site A. Preliminary investigation into landfill siting at Site A considered use of a natural drainage for the waste cells (Damschen & Associates 1990b). This drainage does not hold or transport surface water year round, but it probably does carry water during spring melt and storm events.

4.3.2.1 Direct and Indirect Effects

Site A is not situated within a floodplain, and is not defined as a wetland. There are no perennial drainages or surface water sources such as ponds, creeks, springs, or irrigation canals. Due to their coarser-grained nature, the surface materials at Site A are less susceptible to erosion caused by runoff than at Site E. Water is more likely to infiltrate into the subsurface. The main drainage at Site A transports surface water intermittently, primarily during heavy precipitation events or snowmelt. As a result, a significant amount of runon could enter the waste disposal areas. Landfill design at this site would have to include, as discussed in the Environmental Assessment (1991), a runon diversion system on the periphery of the waste handling and disposal areas.

4.3.2.2 Regulatory Requirements

No regulatory conflicts are expected as a result of landfill development at Site A. As noted in section 4.3.1.2, it is likely that the operating criteria of Subtitle D and state regulations would be met at this site.

4.3.2.3 Irreversible or Irretrievable Commitment of Resources

No irreversible or irretrievable commitment of surface water resources are expected to occur at Site A.

4.3.2.4 Cumulative Impacts

No cumulative impacts are expected to occur at Site A.

4.3.2.5 Potential Mitigation Measures

Applicable mitigation measures are as discussed in section 4.3.1.5.

4.3.3 CCSS Landfill

The closest large or perennial surface water resource to the CCSS Site is Prickly Pear Creek, which runs north-south at the western boundary of section 6, west of the facility. Water quality and quantity data are available for Prickly Pear from the 1990 RI/FS report prepared for ASARCO.

4.3.3.1 Direct and Indirect Effects

The CCSS site is not located within a 100-year floodplain or wetlands area, but the western portion of section 6, which is just west of the CCSS site, is within a floodplain of Prickly Pear Creek (Flood Insurance Rate Map). However, this area is not within the CCSS Landfill site, so a floodplain development plan would not be required.

The existing surface water controls for the CCSS site include a diversion ditch. Erosion from runoff at the CCSS site, as with Site A, should not be of undue concern since the coarse sand and gravel materials allow rapid water infiltration rather than runoff. Assuming that proper mitigation measures are maintained, Prickly Pear Creek should not be adversely affected by a landfill operation at the site.

4.3.3.2 Regulatory Requirements

Applicable regulatory requirements are as discussed in section 4.3.2.2. The CCSS development plan (Tenneson Landfill 1992) includes a runoff/runon control system generally in compliance with Subtitle D. The proposed final cover system, however, will need to be upgraded.

4.3.3.3 Irreversible or Irretrievable Commitment of Resources

No irreversible or irretrievable commitment of resources are anticipated at the CCSS Landfill site.

4.3.3.4 Cumulative Impacts

It will be necessary to coordinate construction, operation, and closure of the expanded CCSS Landfill with the existing operations at this site to minimize traffic congestion and other nuisance factors. No other cumulative impacts are expected.

4.3.3.5 Potential Mitigation Measures

Applicable mitigation measures are as discussed in section 4.3.1.5.

4.3.4 Modifications to the Proposed Action

As described in section 2.5, it is anticipated that recycling would occur at the transfer station, and composting would occur at the landfill, regardless of the location of the landfill. While no surface water impacts are expected from recycling efforts, some leachate could be generated at a composting facility. There is no design or operations plan currently available for such a facility. However, it would likely include a low-permeability pad to prevent the percolation of wastewater into the ground, and a wastewater containment and management plan to avoid contaminating surface water in the vicinity. The retention and settling pond(s) used for leachate collection and surface water control at the landfill could be used for composting effluent control. Wastewater from the composting operation would be tested prior to surface discharge. If applicable water quality standards are not met the water would be transported to a wastewater treatment plant.

4.4 AIR QUALITY

Overall, impacts to air quality should not vary among the alternative sites, since activities associated with landfilling will be similar. Construction, operation, and closure of a landfill at any of the three alternative sites will generate the same relative levels of air pollution. Therefore, the following discussions apply to each of the alternative landfill sites.

Emissions of particulate matter will result from soil handling associated with excavation, wind erosion of disturbed areas, compaction of waste and cover materials, and haul road emissions. These emissions have been estimated using emission factors in AP-42 (U.S. EPA 1985) and the Air/Superfund National Technical Guidance Series, Volume 3 (U.S. EPA 1989). These equations were used to estimate emissions of particulate matter less than 10 microns in diameter (PM_{10}) using particle size multipliers and control efficiencies specified in the emission factors. Material volumes used by the equations are taken from the landfill operation plan (Damschen & Associates 1990a). The landfill was assumed to operate 12 hours per day, 7 days per week. The estimated PM_{10} emissions for the soils handling activities are summarized in Table 4.4-1.

TABLE 4.4-1

ESTIMATED PM_{10} EMISSIONS FROM SOIL HANDLING DURING LANDFILL OPERATION

Activity	Emissions (Tons/Yr[1])
Batch Drop	12.48
Wind Erosion	4.24
Compaction	0.13
Haul Roads	2.01
Total	18.86

[1] Assumes landfill operation 12 hours/day, 7 days/week

Methane emissions were estimated using factors obtained from the Colorado Department of Health (Vasques 1990) and are based on the estimated quantities of refuse placed in the landfill each year. However, actual methane emissions are highly dependent on the type of refuse deposited, soil and atmospheric moisture, rate and degree of microbial activity, and other factors. Methane emissions are presented in Table 4.4-2.

TABLE 4.4-2

ESTIMATED ANNUAL METHANE EMISSIONS (E)

E = 0.1 FT^3 LANDFILL GAS (LFG) PER POUND OF REFUSE DISPOSED PER YEAR

METHANE % BY VOLUME (dry basis)	47.50
MOISTURE % IN LFG	40.00
METHANE DENSITY IN LB/FT^3	0.05
REFUSE PLACED IN LANDFILL IN TON/YEAR	40,000.00

TOTAL LFG GENERATED, FT^3/YEAR	8,000,000.00
TOTAL LFG ON DRY BASIS (FT^3)	4,800,000.00
METHANE GENERATED, FT^3/YEAR	2,280,000.00
METHANE GENERATED, LB/YEAR	115,824.00
METHANE GENERATED, TON/YEAR	57.91

Factors in calculations from: Vasques 1990

4.4.1 Direct and Indirect Effects

Construction and operation activities associated with soil excavation for disposal areas and cover placement will have the most immediate impact on air quality. It is estimated that approximately 12½ tons of PM_{10} material will be released in to the air each year as a result of landfill excavation and construction. Emissions resulting from daily operations (erosion, truck traffic, and compactor activity) will be substantially less. Total emissions from these activities are estimated to be approximately 19 TPY (the significance of this level is described below).

Air emissions of particulate matter during construction and operation may result in substantial impacts for short periods of time, but the overall effect on long-term air quality is not easily assessed. This is because otherwise applicable air emissions models do not adequately predict impacts from area sources, such as a landfill. Particulate emissions were estimated, but ambient air concentrations resulting from these emissions could not be modelled.

Methane emissions were estimated using various assumptions, such as the moisture content of landfill gas, potential methane production, and the amount of refuse landfilled. It is estimated that approximately 58 tons of methane gas would be generated each year (refer to Table 4.4-2). It should be noted, however, that methane is produced by slow-growing anaerobic bacteria in a warm, moist environment that has low oxygen levels. It therefore takes on the order of months or years for methane to be produced once refuse is compacted and covered with soil. Methane production may continue, however, well into the post-closure period. Given the cool, dry climate found at the alternative landfill sites, the methane production estimates may well be overestimated.

4.4.2 Regulatory Requirements

The Air Quality Bureau (AQB) has authority for requiring air impact assessments and permitting sources within the state under the Clean Air Act. According to the calculations above, the facility would not emit 100 tons per year or more of particulate matter or methane. The landfill would therefore not be classified as a major source and not subject to major source regulations. An air quality impact assessment is not required for PM_{10} emissions less than 25 TPY (Coefield 1992). As modeled in the study area, landfill operations at 19 TPY will not require a permit for particulate emissions.

Methane emitted from a solid waste disposal facility has not typically been regulated by permit, possibly because methane generation in Montana landfills is relatively low due to the climactic conditions previously mentioned. However, methane could be considered a volatile organic compound under the existing state air quality rules, and if the amount of methane generated exceeded 25 TPY, an air quality permit would be required (Quinones 1992). Monitoring of actual landfill conditions after the facility is on-line would provide more accurate information regarding methane generation and the need for a permit.

It is expected that compliance with the explosive gas control requirements (Subpart C) of Subtitle D would be achieved through passive collection and venting as described in section 4.4.5 below, if required monitoring indicates the need for controls. No other regulatory impacts are expected. As no open burning will be allowed at the landfill (Marshall 1990a), the air criteria (Subpart C) of Subtitle D will also be met.

4.4.3 Irreversible or Irretrievable Commitment of Resources

No irreversible or irretrievable commitments of air resources is likely to occur if one of the alternative sites is used for landfill development. Impacts to air quality would occur primarily during construction and operation periods, and would be limited to the immediate area of the project. These localized impacts would cease sometime after closure of the landfill.

4.4.4 Cumulative Impacts

No cumulative impacts are clearly identified, since there are no other actions occurring in the vicinity of the alternative sites which would result in greater or lesser impacts to air quality. Any additional housing development in the immediate vicinity of a landfill site would create short-term increases in particulate matter emissions. Wood stove emissions from new houses would contribute to air quality degradation. The ASARCO smelter in East Helena is a major source of air emissions, but use of Site A or the CCSS Site as a landfill for Lewis & Clark County refuse disposal should not cause measurable impacts compared to smelter emissions.

4.4.5 Potential Mitigation Measures

Potential mitigation measures would be applied to minimize the amount of particulate matter released during landfill construction, operation, and closure. The most effective measure would be to pave on-site roads when practical, and keep construction areas and roads moist to reduce the amount of dust created. Long-term soil storage stockpiles would be seeded/vegetated to minimize wind erosion.

Subtitle D (Subpart C) only requires control of methane gas without specifying the type of engineered system. Methane generation can often be controlled by passive collection and venting to the atmosphere. It is usually recommended that collection/venting systems be installed once the final (low-permeability) cover is in place and accumulating methane gases which can become trapped. These systems typically includes horizontal, perforated piping imbedded in a gravel trench at the high points of the closed landfill; the piping in turn connects to solid riser vents that extend above final grade. It is unlikely that sufficient methane would be generated to warrant collection for energy use. Methane monitors can be installed to determine the actual amount of methane generated and released. Subpart C and the state rules requires routine methane monitoring during the active life of the landfill and the post closure period (30 years). If the monitoring results indicate that the minimum regulatory levels of methane are being exceed in structures on site or at the property boundary, controls such as described above with be required to be installed.

4.5 NOISE

Noise impacts will be caused by operation of excavation, compaction, and waste-hauling equipment at the landfill. Impacts will also be created by vehicles transporting waste from the Helena transfer station to the landfill. However, at the rate of only seven to ten truck trips per day (see section 4.9), the noise increase above background would not be significant.

Because specific types and models of equipment to be used on-site are unknown, measured sound levels for equipment similar to that used at the proposed sites have been relied on in this assessment. Specifically, sound levels of 89 dB for loaders and 88 dB for refuse trucks were assumed at a distance of 15 meters from the operating equipment (Construction Engineering Research Laboratory 1978). Since decibels are logarithmic units, the cumulative sound levels from the population density correlations and from vehicle noise analysis cannot be added together using ordinary arithmetic means. Because the sound levels are a measure of the energy, their cumulative effect is evaluated as noted in Table 4.5-1.

TABLE 4.5-1

SIMPLIFIED METHOD FOR SUMMING NOISE LEVELS

When two noises differ by:	Add the following to the higher value:
0 - 1 dBA	3 dBA
2 - 3 dBA	2 dBA
4 - 9 dBA	1 dBA
10 or more dBA	0 dBA

Source: Federal Highway Administration 1980

By way of example, a worse case scenario with two loaders (at 89 dBA) and a refuse truck (at 88 dBA) operating at the same location and time has been assumed. These vehicles would have a combined noise level of 93 dBA at a distance of 15 meters. Additionally, determination of a decreasing noise level at an increasing distance from a source is based on a 6-dBA attenuation for each doubling of distance (Federal Highway Administration 1980). (This is an approximate calculation only because interpolation and rounding are often required.) Therefore, assuming that the 3-vehicle noise described above is generated 30 meters inside the landfill boundary (yielding 93 dBA 15 meters away), a noise impact of 87 dBA will occur at the boundary itself.

Baseline noise levels were provided in Table 3.5-1. These levels would increase to some extent at each of the sites as a result of landfill construction and operation. The level and magnitude of increase will vary slightly from site to site, however. Calculations for the alternative landfill sites show an overall increase in noise levels attributed to construction and operation of the landfill, with a resultant adverse effect on the human environment. As the calculations determine the most conservative value, it must be noted that normal landfill operations may not cause this degree of noise. The timing and duration of noise would depend on the manner of landfill operation (the facility is assumed to be open for 12 hours a day, 7 days a week). Another factor in noise attenuation is the topographic relief between the noise generator and monitoring location, and other barriers such as trees or other vegetation.

4.5.1 Proposed Action - Site E

Noise impacts at Site E were estimated at the private residences west of the landfill, northeast of the landfill and north of Deal Road, and along Lake Helena Drive west of the landfill. The estimated baseline noise level at Site E and the residence west of the landfill is 40 DBA (Table 3.5-1). Noise generated by trucks hauling waste along the haul routes will add to this baseline by an insignificant amount.

4.5.1.1 Direct and Indirect Effects

The residence west of the landfill is near the proposed gate and the noise levels resulting from landfill operations are assumed to be the same as at the landfill boundary, or the 87 dBA derived above. This noise level also represents the cumulative condition of baseline plus landfill noise (the levels differ by more than 10 dBA). This noise increase should also reflect the occasional noise produced by waste transfer trucks passing the residence on Deal Lane.

The residence to the northeast also has a baseline level of 40 dBA, and is located approximately 300 meters from the facility boundary. Based on the 6-dBA attenuation with each doubling of distance, noise at this residence resulting from landfill operations alone is estimated to be 68 dBA. Therefore, the cumulative noise at this residence would also be 68 dBA.

Baseline noise levels on Lake Helena Drive are estimated at 40 dBA (Table 3.5-1). The noise impacts at the residences on Lake Helena Drive, 800 meters from the landfill, were estimated to be 59 dBA, and cumulative noise levels 59 dBA.

4.5.1.2 Regulatory Requirements

The average day/night equivalent sound level identified by the EPA as necessary to protect public health without interference to outdoor activities is 55 dBA (U.S. EPA 1974). This value is not applicable to this project because no law governs its application to landfill operations. However, it is referenced here for comparison to the noise levels estimated at the alternative sites and residences near those sites. The noise impacts and cumulative noise levels from proposed landfill operations do exceed the 55 dBA guideline. However, baseline noise levels at many of the residences are at times likely to exceed the 55 dBA guideline due to vehicle traffic and day-to-day activities.

4.5.1.3 Irreversible or Irretrievable Commitment of Resources

No irreversible or irretrievable commitment of quality resources would occur if one of the alternatives is developed as a landfill. Noise impacts would occur during construction and operation periods. Relative effects would decrease with distance from the landfill site. Impacts would cease almost entirely upon closure of the landfill. However, persons residing near enough to the selected landfill site to experience an increase in ambient daytime noise levels would incur some irretrievable loss in rural lifestyle during landfill construction and operation, at least until landfill closure occurs.

4.5.1.4 Cumulative Impacts

Cumulative impacts were assessed to some extent in the additive calculations conducted for each site. No other cumulative impacts are clearly identified since there are no other actions occurring in the vicinity of the alternative sites which would result in greater or lesser impacts. Additional development in the immediate vicinity of a landfill site would create short-term increases in noise levels due to construction activity and vehicular traffic.

4.5.1.5 Potential Mitigation Measures

Potential mitigation measures include placement of a barrier fence or soil berm along the facility boundary. This could result in a reduction of 5 to 18 dBA depending on the type of barrier constructed. Another mitigation measure for noise could be the planting of trees or scrubs as a windbreak at the property boundary. Additional noise reduction could result from limiting operation of equipment near the landfill boundary and assuring that equipment and trucks have muffling systems which reduce noise to the maximum practicable extent possible. The County has committed to the use of high quality muffling systems on landfill vehicles, and to replace those muffling systems. As an extreme mitigation, those residents most impacted by noise could be relocated at their request, and their property purchased and used as a noise buffer zone.

4.5.2 Site A

4.5.2.1 Direct and Indirect Effects

Noise impacts at Site A were estimated at the landfill boundary and the nearest private residence, which is approximately 1200 meters to the southwest. The estimated baseline noise level at Site A is 40 dBA (Table 3.5-1), and this value is also applicable for the residence to the southwest. Because of the distance to the landfill, attenuation would reduce the noise level resulting from landfill operations (87 dBA) to 56 dBA at the residence. The resulting cumulative noise level at the residence will also be 56 dBA (the differential is greater than 10 dBA). As noted above, truck traffic may add to the noise levels along the haul routes by a small amount.

4.5.2.2 Regulatory Requirements

Applicable regulatory requirements were discussed in section 4.5.1.2; slight exceedance of the 55 dBA guidance is predicted.

4.5.2.3 Irreversible or Irretrievable Commitment of Resources

The commitment of quality resources is as discussed in section 4.5.1.3.

4.5.2.4 Cumulative Impacts

Applicable cumulative impacts were discussed in section 4.5.1.4. The ASARCO smelter in East Helena is likely a major source of noise. Noise levels from this facility are unknown, however. It is not expected that they would significantly exceed background conditions at Site A or the CCSS Landfill site.

4.5.2.5 Potential Mitigation Measures

Applicable mitigation measures are as discussed in section 4.5.1.5.

4.5.3 CCSS Site

4.5.3.1 Direct and Indirect Effects

The estimated baseline noise level at the existing CCSS Landfill Site boundary and the nearest private residences (800 meters to the northwest of the site) is 89 dBA and 61 dBA, respectively (refer to section 3.5.3). Noise impacts from continued landfill operations would result in no change in the values at the residences. The cumulative noise levels are same as the baseline values. Noise generated by truck traffic hauling waste along the haul route will also add to this level, but by an insignificant amount.

4.5.3.2 Regulatory Requirements

Applicable regulatory requirements are as discussed in section 4.5.1.2. It should be noted that the estimated baseline noise levels at the CCSS Site exceed the 55 dBA guideline.

4.5.3.3 Irreversible or Irretrievable Commitments of Resources

The commitment of quality resources is as discussed in section 4.5.1.3.

4.5.3.4 Cumulative Impacts

Applicable cumulative impacts are as discussed in section 4.5.1.4 and 4.5.2.4.

4.5.3.5 Potential Mitigation Measures

Mitigation measures are as discussed in section 4.5.1.4.

4.5.4 Modification to the Proposed Action

Operation of a recycling center can increase baseline noise levels, especially in rural areas. If implemented, the recycling component of this alternative would be accomplished at the Helena transfer station, constructed in 1993. The current design for this station includes recycling bins for containment of segregated materials. Operations would include controlled access by residents, who will place their separated materials in the bins (Damschen & Associates 1991b). It is presumed that full bins will be delivered by the City to a vendor, such as Montana Recycling, for resale or reuse.

Noise associated with recycling typically comes from glass handling, but the level is not known. This impact can be mitigated by limiting recycling, as well as bin loading and unloading, to business hours during mid-week. Gentle handling can also be encouraged to minimize breakage. No significant increase over the landfill generated noise levels is expected from an on-site composting operation.

4.6 WILDLIFE

Many wildlife species have adapted quite well to the presence of humans while other species avoid contact. Wildlife occurrence throughout the Helena Valley includes both types. Free-ranging wildlife and their habitat (food, water, and cover) are inseparable. The presence and operation of an active landfill will provide these critical needs to only a few species. Most species will simply avoid the area of disturbance, assuming suitable habitat exists in close proximity. Some species may be impacted to such an extent that individuals and possibly populations will be affected.

Generally speaking, those species most likely to increase in density as a direct result of landfill operations, are classified as "nuisance animals." Gulls, ravens, crows, rats, and skunks will typically be attracted to conditions associated with a solid waste facility. Historically this problem has been controlled by modern operational practices including compaction, daily (soil) covering, and control of blowing litter. Nuisance species are extremely mobile and well adapted to locating food sources. Alternate site locations on a scale as small as the Helena Valley will not dramatically alter anticipated population numbers of these species. Likewise, none of these species are considered "sensitive" or require special protection. No negative impacts to these species will occur under the various alternatives. However, a substantial increase in local population density could indirectly impact other species. Mitigation measures currently planned for the landfill, including use of a transfer station to minimize stockpiling of uncontrolled waste and frequent covering of waste at the landfill, will help to keep this potential impact in check.

Wildlife species use different modes of transportation within or between habitats. However, individuals, communities, and populations may become so attached or dependent on "critical" habitats that they will not move, and disturbance or destruction of this habitat can cause a decline in their population. Of major concern would be disturbance to critical habitat of any threatened or endangered species. None of the proposed landfill sites evaluated are directly located on, or immediately adjacent to, any designated "critical" habitat for any species. However, areas in close proximity to these sites do provide "preferred" habitat for several species. sections 3.6.4.1 and 3.6.4.2 provided a narrative of occurrence and distribution of the two endangered species which occur in the study area. The following is a qualitative discussion of their respective food habits and potential for adverse impacts due to the operation of a Class II landfill. This evaluation applies to all of the alternative sites.

- Bald Eagle - Historical nationwide declines in bald eagles have occurred as a result of the bioaccumulation of the pesticide DDT. After DDT was banned from use in the United States in 1972, bald eagles have slowly recovered and re-populated historical nesting areas. As described in section 3.6.4.1, bald eagles do nest and feed in the study area, and they are likely to be attracted to a landfill if potential food sources in the refuse are not covered immediately after disposal. Also, an increase in populations of "nuisance animals" such as rodents, which can be a food source for bald eagles, could also provide an attraction to the landfill area.

  Other chemicals than DDT could also potentially bioaccumulate and concentrate in bald eagles and higher-order species. The potential for scavenging wildlife (gulls and ravens) to ingest toxic substances at the landfill is low, due to planned coverage of waste shortly after placement. Additionally, the landfill will not be licensed to receive **regulated** hazardous wastes. Measures to monitor and control leachate, which could carry soluble contaminants, are included in the plan of operation (Damschen & Associates 1990a). Possible attraction to animal carcasses will be moderated by immediately burying all carcasses disposed at the landfill. Finally, food habits of migratory bald eagles frequenting the area center around scavenging dead salmon found below the nearby dams.

- Peregrine falcon - This raptor had become extinct in every state east of the Rockies and only 40 known nesting pairs remained in the west by the early 1970's. Research determined the decline was also due to DDT. Populations are now increasing. As described in section 3.6.4.2, there is peregrine habitat in the study area along the Missouri River corridor, and a reintroduction site is relatively near Site E. Peregrines would be less likely than eagles to be attracted to the landfill. However, the presence of scavenger birds could provide some inducement as an easy prey food source.

  Feeding habits of peregrines differ significantly from bald eagles, who are chiefly scavengers. Peregrines are considered one of the most evolved birds of prey in the world. They can drop 1,000 feet at speeds approaching 200 mph to capture prey in flight. Principal prey include pigeons, blackbirds, and waterfowl.

Anticipated negative impacts to other wildlife due to the presence of an active landfill could include avoidance of the area and/or direct loss of habitat. Indirect impacts may occur in the form of highway mortality, increased susceptibility to predation, and a decrease in off-site habitat productivity.

Potential impacts to high profile species and mitigation measures are addressed below for each alternative. The evaluations used to anticipate these impacts are based primarily on an understanding of the behavior of the species discussed.

4.6.1 Proposed Action - Site E

4.6.1.1 Direct and Indirect Effects

Site E does not provide critical needs to any wildlife species. Current habitat characteristics provide seasonal food sources in the form of wheat and cover consisting of secluded, gently rolling terrain in an area being developed to some extent for rural housing. Small grain crops are numerous throughout the Helena Valley and the loss of this 80-acre plus food source will not measurably impact any wildlife population.

Wildlife escape and hiding cover sources throughout the "bench" east of Helena are limited. Antelope use on this site is consistent. Displacement of these individuals (approximately 10 to 30 animals) will likely occur if a landfill is operated here. Adjacent areas on all sides of the site will provide adequate habitat requirements for this small population. The endangered bald eagle and peregrine falcon inhabit areas 2 to 3 miles east of this site. Feeding habits of both species make them potentially receptive to indirect impacts. Chemicals or physical stressors that may bioaccumulate in the environment could potentially find their way to this food chain. Possible impacts to federally protected raptors may be more probable at this site, compared to alternative locations, due to its closer proximity to their home ranges.

One mechanism of contaminant transfer would be through an open source of leachate, or water contaminated by leachate. If leachate contaminates the stormwater detention ponds, wildlife could be susceptible to contaminant uptake by ingestion. Other potential impacts could include the degradation of off-site surface waters. Various waterfowl species use the highly preferred wetlands and shallow aquatic habitat associated with Lake Helena. Reductions in local populations could result if leachate were allowed to enter these waters. Planned operations requiring a liner, leachate collection, monitoring program, and perimeter fencing would help prevent this occurrence.

4.6.1.2 Regulatory Requirements

Local biologists from the Montana DFWP were consulted concerning wildlife impacts in the vicinity of Site E. They concluded that potential impacts associated with the proper operation and maintenance of a licensed solid waste landfill at this site would not conflict with any wildlife goals and objectives (Joslin and Carlson 1992).

Compliance with the cover material, disease vector, and access requirements (Subpart C) of Subtitle D will be achieved (40 CFR §258.21, §258.22, and §258.25). Disease vectors (rodents, flies, mosquitos, insects, and other animals) would be controlled by immediate covering of waste materials.

4.6.1.3 Irreversible and Irretrievable Commitment of Resources

No irreversible and irretrievable commitment of wildlife resources would occur as a result of landfill development at this site. Displacement of antelope or other wildlife could occur during operation, but rehabilitation would likely occur after regrading, revegetation, and closure of the facility.

4.6.1.4 Cumulative Impacts

Past and continued development of the Helena Valley has placed a large stress on several big game species. The concept of "wild free-ranging" populations is slowly being degraded throughout the valley. Native bison have been eradicated from the Valley. Elk have abandoned traditional winter ranges in the Valley. Traditional mule and white-tail deer habitat has been dramatically reduced. Pronghorn antelope are having a hard time adapting to the numerous fences, dogs, and roads associated with current changes. Increasing demands for rural homesites will further stress and fragment this isolated population of pronghorn. However, since the vast majority of the valley is under private ownership, preventing these impacts may not be possible.

Development of a landfill at Site E would add another increment of lost habitat for some species such as antelope, at least for the time the landfill is under construction and operation. Further housing development in this area of Lewis & Clark County would have similar effects. The cumulative significance of these actions is not known.

4.6.1.5 Potential Mitigation Measures

Mitigation measures currently being considered would reduce, but not totally eliminate, potential impacts to wildlife. These include a transfer station, recycling waste oil, covering waste immediately upon deposition, covering animal carcasses immediately, liner and leachate collection systems, ground water monitoring, and screening to prevent hazardous waste disposal. These mitigations have been incorporated into the landfill license application (Damschen & Associates 1990a, 1991b; Damschen 1990b and 1991a; and Hazen 1991).

Additional measures which could reduce potential impacts include diversion of small quantity generator and household hazardous wastes (i.e., paints, solvents, and batteries) away from the landfill, and reclamation standards aimed at providing cover-type terrain and planting of preferred native food sources for ungulates. Measures at this site which could also help ensure protection for the endangered raptors include the installation of raptor barriers on nearby power poles to discourage roosting, netting and fencing at retention ponds, and requiring immediate reporting and removal of road-killed wildlife.

4.6.2 Site A

4.6.2.1 Direct and Indirect Effects

Site A does not provide critical needs to any wildlife species. Present habitat characteristics include food sources of native forage, cover by virtue of a secluded gently rolling terrain in an area being developed for rural housing, and preferred winter range for antelope. As discussed for Site E, wildlife cover sources throughout the Helena Valley are relatively limited. Few areas provide a secluded, elevated southern exposure for use as winter range. Land immediately south of Site A does provide these limited requirements. Antelope use on this site is abundant, particularly in the winter when the southern exposure stays free of snow. The area is not, however, designated as "critical" winter range by the Montana DFWP. Summer displacement of this small herd of antelope (approximately 30 to 50 animals) would likely occur if a landfill is operated here. Winter use could be impacted, but it may not be totally abandoned due to the herd's preference for this site.

Site A is located about ten miles from the bald eagle and peregrine falcon preferred feeding and nesting areas. However, feeding habits of both species make them potentially receptive to indirect impacts associated with a landfill at this site. Chemicals or physical stressors that may bioaccumulate in the environment, could find their way to this food chain. Potential impacts to these federally protected raptors may be less probable at this site due to its distance from their home ranges. Other potential direct and indirect impacts to raptors or wildlife at Site A are as described for Site E.

4.6.2.2 Regulatory Requirements

Applicable regulatory requirements are as discussed in section 4.6.1.2.

4.6.2.3 Irreversible and Irretrievable Commitment of Resources

The commitment of wildlife resources is as discussed in section 4.6.1.3.

4.6.2.4 Cumulative Impacts

Past and continued development of the South Hills has placed a large stress on several big game species. Antelope, deer, and elk have historically used these hills for winter range. The rural housing developments south of the site are effectively cutting off migration corridors for these animals. Impacts associated with roads, fences, and dogs also continue to displace these animals. Private ownership of the surrounding lands with escalating rural housing demand will continue to fragment this habitat. Additional cumulative impacts were discussed in section 4.6.1.4.

4.6.2.5 Potential Mitigation Measures

Mitigations presented in section 4.6.1.5 also apply to this site. A preferred habitat mitigation would be to keep intact the southern exposure and bare ridge southwest of the site. Disturbances to this area could be minimized and/or its existence ensured by acquisition and maintenance as winter range for antelope.

4.6.3 CCSS Landfill

4.6.3.1 Direct and Indirect Effects

The CCSS site does not provide critical needs to any wildlife species. Present habitat characteristics include food sources (garbage) for nuisance species and limited habitat for small mammals and passerine birds. The current land use as a solid waste landfill with associated human activity has reduced game use on the site. The expansion of this landfill should not cause any additional impact on wildlife.

In fact, if expansion of this landfill does occur, compliance with Subtitle D and the proposed mitigation measures already discussed could help reduce wildlife impacts. (The current landfill operation was licensed before Subtitle D was enacted, and will require additional environmental protection systems for upgrade or expansion.)

The CCSS site is located approximately nine miles from the endangered bald eagle and peregrine falcon preferred feeding and nesting areas. Feeding habits of both species make them potentially receptive to indirect impacts associated with a landfill at this site. If not properly handled, chemical or physical stressors that may bioaccumulate in the environment could find their way to this food chain. Potential impacts to these federally protected raptors may be less probable at this site due to its distance from their home ranges. Other potential direct and indirect impacts to raptors or wildlife were described in section 4.6.1.1.

4.6.3.2 Regulatory Requirements

Applicable regulatory requirements are as discussed in section 4.6.1.2.

4.6.3.3 Irreversible and Irretrievable Commitment of Resources

The commitment of wildlife resources is as discussed in section 4.6.1.3.

4.6.3.4 Cumulative Impacts

Applicable cumulative impacts are as discussed in sections 4.6.1.4. and 4.6.2.4.

4.6.3.5 Potential Mitigation Measures

Applicable mitigation measures are as discussed in section 4.6.1.5.

4.7 VEGETATION

All of the alternative landfill sites under evaluation have been previously impacted by human activities. Dryland small grain crop production has occurred on, or adjacent to, all these sites. Livestock grazing and associated improvements have occurred on the native range. The incorporated cities of Helena and East Helena have altered vegetation within their limits. Continual growth of rural housing has accelerated vegetative fragmentation and the introduction and spread of exotic (non-native) species. No threatened or endangered plant species or communities of special concern are known to exist on or near any of the landfill sites. None of the sites are classified as Prime Agricultural Farmlands or contain wetlands (Bishop 1992).

4.7.1 Proposed Action - Site E

4.7.1.1 Direct and Indirect Effects

Site E has been commercially farmed for the dryland production of wheat. The location of nearby irrigation canals enhances the probability of successful reclamation during post-closure (i.e. some controlled moisture application is necessary for vegetative growth). Weed species present at the site include diffuse knapweed and various thistle species. Direct alteration of vegetative cover will occur due to landfill operations. Excavation of landfill cells and borrow materials, heavy equipment use and movement, and incoming vehicle traffic all increase the likelihood of weeds spreading on the property. Implementation of a weed control plan will be necessary to minimize the spread of these noxious weeds, and to prevent new or increased infestation in lands surrounding the site.

Important wetland and aquatic vegetative communities are located approximately 1.5 miles northwest at Lake Helena. Direct effects to these resources are not likely. As described in section 4.6.1.1, the alterations at the site property would remove some wildlife habitat. This could result in some indirect, relatively minor effect on habitat and vegetation in nearby areas.

4.7.1.2 Regulatory Requirements

No known regulatory conflict with respect to vegetative resources is expected to occur. Subpart F of the Subtitle D regulations require that the final cover system be suitable for vegetation, and that the vegetative cover be maintained throughout the post-closure period. It is expected that these measures would be provided for a Site E landfill.

A weed control plan may be required as a license condition, to document how exotic species will be controlled. The State of Montana Noxious Weed Control Act and Rules authorizes counties to establish weed districts. The Lewis & Clark County Weed District has specified a list of noxious weeds. Any landowner with these weeds on their property is required to prevent their propagation. If the infestation is too large to control in one season, a Management Plan must be filed and approved by the Weed District Board.

4.7.1.3 Irreversible and Irretrievable Commitment of Resources

No irreversible and irretrievable commitment of resources is expected to occur as a result of landfill development at Site E. Reclamation should return the area to essentially pre-landfill conditions in terms of habitat and forage.

4.7.1.4 Cumulative Impacts

Native vegetation has been altered throughout the Helena Valley. No significant impact on local vegetative patterns would occur provided proper reclamation of the site following landfill closure and active weed control is provided.

4.7.1.5 Potential Mitigation Measures

An active weed control program could be administered, which would include herbicidal, mechanical, and biological control of noxious weeds. Proper stockpiling and replacement of topsoil will be necessary for revegetation. Runoff controls and stockpile covers would reduce the loss of reclamation soils during rains and storm events. The site should be reclaimed as each landfill cell is filled. Ongoing reclamation and revegetation will stabilize cover materials to reduce erosional impacts. It will also help restore native feed and cover requirements to the various wildlife species displaced by this development. Selection of plant species for revegetation of the disturbed areas should be based on native vegetation, plant establishment potential, growth characteristics, soil adaptation, stabilizing quantities, wildlife palatability, and post-closure land use objectives.

4.7.2 Site A

4.7.2.1 Direct and Indirect Effects

Portions of Site A have been commercially farmed for the dryland production of wheat. A substantial portion of the site is used as rangeland for livestock grazing. Post-closure land use may be more likely to be rangeland than at Site E due to proximity to the ASARCO smelter, which reduces the potential for housing development.

Several weed species may be found on the site including diffuse knapweed and various thistle species. Excavation of landfill cells and reclamation materials, heavy equipment use and movement, and incoming vehicle traffic all increase the likelihood of weeds spreading on the property. Implementation of a weed control plan will be necessary to minimize the spread of these noxious weeds, and to prevent new or increased infestation in lands around the site.

As described in section 4.6.2.1, the alterations at the site property would remove or alter some wildlife habitat. This activity could have some indirect, relatively minor impacts on habitat and vegetation in nearby areas, and result in proportional changes in wildlife distribution.

4.7.2.2 Regulatory Requirements

Applicable regulatory requirements are as discussed in section 4.7.1.2. Although no proposed reclamation plan currently exists for Site A, it is expected that compliance with Subtitle D and the state Noxious Weed Control Act would be achieved in the event of landfill development.

4.7.2.3 Irreversible and Irretrievable Commitment of Resources

The commitment of vegetative resources is as discussed in section 4.7.1.3.

4.7.2.4 Cumulative Impacts

Applicable cumulative impacts are as discussed in section 4.7.1.4.

4.7.2.5 Potential Mitigation Measures

Applicable mitigation measures are as discussed in section 4.7.1.5.

4.7.3 CCSS Landfill

The site of the CCSS Landfill has already been impacted by the operation of a solid waste landfill. Portions of the site have remnants of past wheat production. Weed infestations are evident throughout the site, although past control efforts have prevented any widespread invasions. Stockpiling of soil and revegetating of landfill cells has been minimal. If current operating and mitigation plans for an expanded landfill were licensed at this site, existing impacts to vegetation would continue, but to a lesser extent. Impacts would include the loss of stockpiled soil to erosion, continued problems with noxious weeds, and continued reduction in available forage. An expansion of this site to allow disposal of Lewis & Clark County solid waste would probably improve vegetative conditions, as the license would likely include more stringent reclamation and revegetation requirements.

4.7.3.2 Regulatory Requirements

Applicable regulatory requirements are as discussed in section 4.7.1.1. Although no proposed reclamation plan currently exists for the expanded CCSS Landfill, it is expected that compliance with Subtitle D would be required in the event of **further** landfill development.

4.7.3.3 Irreversible and Irretrievable Commitments of Resources

The commitment of quality resources is as discussed in section 4.7.1.3.

4.7.3.4 Cumulative Impacts

Applicable cumulative impacts are as discussed in section 4.7.1.4.

4.7.3.5 Potential Mitigation Measures

Applicable mitigation measures are as discussed in section 4.7.1.5.

4.8 CULTURAL RESOURCES

Impacts to known sites were analyzed within the framework of the National Historic Preservation Act (October 31, 1992) requirements, and implementing regulations found in 36 CFR 800. Since there have been no comprehensive cultural resources surveys at any of the three alternative sites, all impacts cannot be known or predicted. Therefore, the impact analysis included a review of the potential for unrecorded resources to be at these locations. These types of reviews are qualitative, and other conclusions could be drawn from the existing data. Information used to substantiate these conclusions includes reports referenced in section 3.8, and consultation with the State Historic Preservation Office (SHPO) of the Montana Historical Society. This evaluation of potential impacts to cultural resources as a result of landfill development has been based on the following factors:

- Site significance is defined by 36 CFR 60.4 with respect to eligibility for the National Register of Historic Places

- The integrity of prehistoric sites potentially located in the three alternative sites would previously have been substantially damaged by cultivation

- Direct impacts to significant cultural resources are usually long-term and permanent; however, standard mitigation measures may be used

- Historic sites located outside the potential landfill boundary may be subject to secondary visual impact due to changes in the historic landscape --- the determination of these indirect effects on historic sites located outside the landfill area could be controversial

4.8.1 Proposed Action - Site E

4.8.1.1 Direct and Indirect Effects

No known prehistoric sites at Site E would be directly affected. Following an examination of the site in 1990, it was concluded that there was a low potential for intact prehistoric resources due to previous cultivation (Schwab 1990). There is a historic site (building and farming-related trash) that may be permanently affected during use of the property as a landfill. There may also be remains of a historic road/trail and ditch that could be impacted. These features were described in section 3.8.1.

4.8.1.2 Regulatory Requirements

Regulatory conflicts could occur if Section 106 of the National Historic Preservation Act and implementing regulations at 36 CFR 800 were not followed prior to project approval and implementation. This includes requirements for consultation with the Montana State Historic Preservation Officer, and may include requirements for additional field investigations. It is expected that compliance with these regulations will be achieved at Site E.

4.8.1.3 Irreversible or Irretrievable Commitments of Resources

Cultural resources are a non-renewable resource. Any such resources lost during landfill construction or operation would constitute an irreversible and irretrievable commitment. Mitigation is possible in some circumstances.

4.8.1.4 Cumulative Impacts

Due to the small area of impact, existing disturbance, and low potential for the occurrence of a number of significantly historic sites, the cumulative impact of lost cultural resources is considered to be very low at Site E. If data recovery is conducted prior to project implementation, there could be a increase in the cumulative knowledge of our prehistoric and/or historic heritage, which could positively affect the cumulative impacts of site development.

4.8.1.5 Potential Mitigation Measures

The historic site at Site E should be recorded by an appropriate professional, and its potential eligibility to the National Register of Historic Places determined. Physical remains of the historic road should be investigated and recorded, if present, and a determination of eligibility made. Data recovery is considered acceptable mitigation for sites determined eligible for the Register under 36 CFR 60.4. Data recovery may include archaeological excavations, historic records searches, ethnographic inquiries, drawings, maps, and photographs.

It must also be determined if the project will adversely impact these sites. If the historic building was determined to be significant, potential mitigation measures may include structure relocation.

4.8.2 Site A

4.8.2.1 Direct and Indirect Effects

There are no known cultural resources that would be impacted by this alternative, but there has been no comprehensive survey undertaken in this location. Because a substantial portion of this site has been used only for livestock grazing, with little cultivation, there is a potential for relatively undisturbed cultural resources. Use of the property as a landfill would present a high probability that any cultural resources on the site would be directly impacted.

4.8.2.2 Regulatory Requirements

Applicable regulatory requirements are as discussed in section 4.8.1.2.

4.8.2.3 Irreversible or Irretrievable Commitments

If no cultural resources are impacted, there would be no commitment of resources. Any resources lost, however, would constitute an irreversible and irretrievable commitment.

4.8.2.4 Cumulative Impacts

Cumulative impacts were discussed in section 4.8.1.4. As it appears that Site A has not been extensively cultivated, there is a greater likelihood of intact prehistoric resources, and the negative impacts of cumulative losses could be greater. However, more knowledge would be gained through resources data recovery at the site.

4.8.2.5 Potential Mitigation Measures

The Montana Historical Society (Lippincott 1992) has recommended this site be surveyed for cultural resources prior to land-disturbing activities. If significant sites are located and could not be avoided by project re-design, mitigation measures may include those discussed in section 4.8.1.5.

4.8.3 CCSS Landfill

4.8.3.1 Direct and Indirect Effects

There are no known resources that would be directly impacted by development of this alternative; however, no comprehensive surveys have been undertaken. Portions of this property are currently used as a landfill, and the remainder of the site has been recently cultivated. The Kleffner Ranch (the cultural significance of which is unknown) is located northwest of this site. The site has not been recorded or evaluated for its potential eligibility to the National Register. It may be indirectly impacted, at least visually, by an expanded landfill. These effects could include a change in the historic landscape of the Kleffner Ranch.

4.8.3.2 Regulatory Requirements

Applicable regulatory requirements are as discussed in section 4.8.1.2.

4.8.3.3 Irreversible or Irretrievable Commitments

Resource commitments were discussed in sections 4.8.1.3 and 4.8.2.3. If the Kleffner Ranch is determined eligible for the National Register and an impact is determined, it may not be irreversible. This will depend on the mitigation measures described below.

4.8.3.4 Cumulative Impacts

Applicable cumulative impacts are as discussed in sections 4.8.1.4 and 4.8.2.4.

4.8.3.5 Potential Mitigation Measures

The Montana Historical Society (Lippincott 1992) has recommended a professional cultural resources survey be undertaken at this site prior to future land-disturbing activities. Sections 4.8.1.5 and 4.8.2.5 discussed potential mitigation measures if significant cultural resources are identified.

The Kleffner Ranch should be examined to determine the potential for visual impacts. If this potential exists, the site should be recorded and a determination made of its potential National Register eligibility. If the site is determined eligible and the significance includes the historic landscape, a determination should be made as to how project implementation would affect the site. Mitigation measures may include project re-design or specialized reclamation and site rehabilitation.

4.9 ROADS AND TRANSPORTATION

As described in section 3.9, landfill development at any of the alternative sites would require the use of various roads in the cities of Helena, East Helena, and unincorporated Lewis & Clark County as haul routes for solid waste. Once the landfill becomes operational, approximately 7 daily truck trips will be required to haul the solid waste from the Helena transfer station to any one of the alternatives (Damschen & Associates 1990a). Over time, the number of truck trips would increase, as population and economic growth increase the size of the solid waste stream. The following discussion provides a description of the potential associated impacts on traffic circulation, road hazards, conditions, and safety along the haul routes identified for each site. Additionally, the Modification to the Proposed Action and No Action alternatives have been addressed at the end of this section. Though minimal, both will have some transportation-related impacts.

The following evaluation was primarily based on existing and projected traffic data provided by the Lewis & Clark County Planning Department (1992), the Montana Department of Highways (1992), and the Helena Urban Transportation Plan (1992). Tables 3.9-1, 3.9-2, and 3.9-3 included applicable data for the haul routes associated with the various site alternatives.

Transportation-related impacts become important if (1) the landfill would further aggravate existing or projected traffic accident or delay problems, (2) significant threats to public safety are caused, (3) adverse weather conditions could prevent the orderly transportation and disposal of solid waste, or (4) substantial road modifications are required. Long term maintenance and repair of roadway discussed in section 3.9 is not discussed in the following sections. Certain roads, such as Interstate 15 and Highway 12/187 are designed and constructed for large volume use and higher percentage of truck traffic than local roadways. Impacts on these roadways from the projected traffic from this action would be very slight. The impact of the additional truck traffic to other roadways listed is impossible to predict in a quantifiable manner.

In general, this section has been developed on the basis of three assumptions:

- The Helena transfer station is a separate project and has been constructed. The station will be used regardless of which alternative site is selected. Impacts relating to construction, operation, or truck traffic at the transfer station have not been evaluated as a part of this EIS.

- All solid waste truck-trips destined for any of the alternatives are assumed to originate at the transfer station. No additional collection points or potential rural transfer stations were considered under this analysis.

- Access to the landfill, regardless of which site is selected, will be denied to small individual haulers. Those haulers disposing of small quantities of waste will be assumed to transport their waste only to the transfer station. This will significantly limit the number of vehicle-trips to the landfill, thereby reducing transportation-related impacts on residents.

In order to complete this transportation evaluation, short-term vs long-term impacts, growth rates, and the level of service associated with various roads and intersections were established. The following paragraphs describe these elements.

Observed traffic conditions for 1991 and 1992 were used to assess the impacts of waste hauling over the short-term, which has been defined to cover the next 5 years. However, as the proposed landfill is designed to provide 50 years of solid waste disposal for the County, long-term impacts were also considered. Long-term has been defined as extending only until the year 2010. Although this does not represent the full lifespan of the landfill, the lack of projected traffic data limits the ability to accurately predict impacts beyond this date.

The growth rate of the solid waste stream over any period of time can be affected by a variety of factors such as the availability of recycling programs, success of consumer and waste-generator education programs, population growth, per capita solid waste generation, and economic growth. Because it is expected that, over the short-term, the awareness of County residents will significantly increase with respect to waste reduction, recycling, and reuse. Therefore, it has been assumed that the waste generated by an increasing population base in the next five to ten years will be offset by diversion and recycling efforts. In other words, an increase beyond the 7 daily trips is not expected during this 5-year period.

Long-term growth rates were identified on the basis of available population and traffic projections (Robert Peccia & Associates 1992). Growth rates that can be expected to occur between now and 2010 typically range from slow (about 15 percent) to rapid (45 percent). In this analysis, a moderate rate of 30 percent was applied. Therefore, based on the 1991 40,000-TPY waste generation rate (Damschen & Associates 1990a) and a 30 percent growth scenario, the Lewis & Clark County wastestream can be expected to increase to 52,000 TPY by 2010. This would result in an additional 3 daily truck trips, or a total of 10 round-trips per day between the transfer station and the landfill over the next 20 years.

LOS D was selected as the threshold for waste hauling-related impacts in this analysis. Any intersection along the various haul routes with a LOS D or lower was considered to experience a significant number or severity of impacts. (See section 3.9 for descriptions of LOS levels.) The LOS ratings for each of the primary intersections along each haul route are included in Table 3.9-2.

4.9.1 Site E

4.9.1.1 Direct and Indirect Effects

As shown in Table 4.9-1, the short-term traffic volume would increase by less than 0.3 percent within the city limits (Benton and Custer Avenues). York Road and Lake Helena Drive, in unincorporated Lewis & Clark County, can expect an overall traffic increase of 0.5 to 5.67 percent. Therefore, the addition of 7 daily trips to Site E represents a relatively minor increase in vehicular traffic over the majority of the route. The 10 to 12.39 percent increase along Deal Lane is primarily a function of the small volume of baseline traffic currently observed (refer to Table 3.9-1), when compared to other portions of the haul route.

Over the long-term (Table 4.9-2), projected traffic along the entire route would increase from 0.11 to 0.95 percent. Therefore, the addition of 10 round trips would not result in large traffic increases. These long-term estimates do not include Lake Helena Drive or Deal Lane as traffic forecasts for the year 2010 were not available. As these roads experience less baseline traffic than York Road, the additional trips would have a greater impact than for the rest of the route. This impact would probably result in a 5 to 15 percent increase in traffic on those roads.

TABLE 4.9-1

PROJECTED SHORT-TERM BASELINE TRAFFIC IMPACTS DUE TO SOLID WASTE HAUL TRIPS[1]

Alternative	Road	Baseline ADT	Projected % Increase
Site E	Benton Avenue	6,400	0.22
		5,500	0.25
	Custer Avenue	10,700	0.13
		10,900	0.13
		6,800	0.21
		6,000	0.23
		5,500	0.25
	York Road	2,800	0.50
		2,640	0.53
		1,220	1.15
		1,399	1.00
	Lake Helena Drive	328	4.27
		247	5.67
	Deal Lane	140	10.00
		113	12.39
Site A Scenario 1	Benton Avenue	8,100	0.17
	Lyndale Avenue	21,600	0.06
	N. Main Street	15,200	0.09
		12,200	0.11
	Cedar Street	14,300	0.10
		12,800	0.11
	Interstate 15	12,900	0.11
	Highway 12/287	14,700	0.10
		8,500	0.16
		12,590	0.11
	Smelter Road	388	3.60

TABLE 4.9-1
(Concluded)

Alternative	Road	Baseline ADT	Projected % Increase
Site A Scenario 2	Benton Avenue	8,100	0.17
	Lyndale Avenue	21,600	0.06
		13,500	0.10
	Montana Avenue	21,000	0.07
	11th Avenue	13,800	0.10
		14,600	0.10
	Highway 12/287	Same as Site A/Scenario 1	
	Smelter Road	Same as Site A/Scenario 1	
Site A Scenario 3	Benton Avenue	6,400	0.22
		5,500	0.25
	Custer Avenue	10,700	0.13
		10,900	0.13
		6,800	0.21
		6,000	0.23
	Washington Street	4,100	0.34
	Airport Rd (at I-15)	12,800	0.11
	I-15 to Site A	Same as Site A/Scenario 1	
CCSS Landfill	Transfer Station to Highway 12/287	Same as Site A/Scenarios 1, 2 & 3	
	Highway 12/287	14,700	0.10
		8,500	0.16
		12,590	0.11
	Highway 518	1,070	1.31

[1] 7 daily trips (14 one-way trips) over next five years

Sources: Robert Peccia and Associates 1992
Lewis and Clark County Planning Department 1992

TABLE 4.9-2
(Concluded)

TABLE 4.9-2

PROJECTED LONG TERM CHANGES IN AVERAGE DAILY TRAFFIC VOLUMES

Alternative	Road	Projected ADT for 2010	Moderate Growth[1] % Increase
Site E	Benton Avenue	9,100	0.22
		7,200	0.28
	Custer Avenue	14,400	0.14
		17,000	0.12
		18,190	0.11
		15,600	0.13
		14,700	0.14
	York Road	9,400	0.21
		7,100	0.28
		3,900	0.51
		2,100	0.95
	Lake Helena Drive	No Data	---
	Deal Lane	No Data	---
Site A Scenario 1	Benton Avenue	8,600	0.23
	Lyndale Avenue	25,600	0.08
	N. Main Street	25,600	0.08
		21,100	0.09
	Cedar Street	19,200	0.10
		20,200	0.10
	Interstate 15	27,200	0.07
	Highway 12/287	21,400	0.09
		21,200	0.09
		17,200	0.12
	Smelter Road	1,500	1.33

Alternative	Road	Projected ADT for 2010	Moderate Growth[1] % Increase
Site A Scenario 2	Benton Avenue	8,600	0.23
	Lyndale Avenue	25,600 14,100	0.08 0.14
	Montana Avenue	21,500	0.09
	11th Avenue	15,700 16,600	0.13 0.12
	Highway 12/287	Same as Site A/Scenario 1	
	Smelter Road	Same as Site A/Scenario 1	
Site A Scenario 3	Benton Avenue	9,100 7,200	0.22 0.28
	Custer Avenue	14,400 17,000 18,190 15,600	0.14 0.12 0.11 0.13
	Washington Street	9,800 11,200	0.20 0.18
	Airport Rd at I-15	20,200	0.10
	I-15 to Site A	Same as Site A, Scenarios 1 & 2	
CCSS Landfill	Transfer Station to Highway 12/287	Same as Site A/Scenarios 1, 2, & 3	
	Highway 12/287	21,400 21,200 17,200	0.09 0.09 0.12
	Highway 518	1,800	1.11

[1] 10 daily trips (20 one-way trips) through 2010

Sources: Robert Peccia and Associates 1992
Lewis and Clark County Planning Department 1992

According to the Helena Urban Transportation Plan, the only location along the Site E haul route that is presently experiencing traffic congestion is the intersection of Custer/Montana Avenues (refer to Table 3.9-2). That intersection is currently operating at LOS C and would therefore not be significantly impacted over the short-term, using an average of 7 trips per day (Robert Peccia & Associates 1992). Over the long-term, based on 10 trips per day, the additional traffic could aggravate delays and cause greater impacts, contributing to an LOS F rating. This impact could be reduced substantially if truck trips were scheduled to avoid using the haul route during peak traffic hours, which occur in the early morning, and late afternoon to early evening (see section 4.9.1.5 for mitigations).

High-accident locations along the Site E haul route include the intersections of Custer Avenue/McHugh Lane and Custer Avenue/Montana Avenue (Table 3.9-3). Since the proposed project would create additional truck traffic at these problem intersections, the risk and rate of accidents would likely increase. The proposed project could also increase the risk of accidents and injuries where the route passes the Four Georgians and Warren Schools due to large numbers of pedestrians, bicyclists, and motorists going to and from those schools. This impact could be reduced if haul trips were scheduled to avoid the times when students are travelling to and from school.

Road improvements necessary to the development of a landfill at Site E include:

- Landfill Access Road - will require a crushed gravel base and chip seal.
- Lake Helena Drive - improving the road base, chip seal coating, signs and striping.
- Deal Lane - improving the road grade, the road base, chip seal coating, signs and striping.

Additional road improvements for intersections and/or road segments along the Site E haul route that are independent of the proposed landfill include turning lane construction and signalization at the intersection of Custer and Benton Avenues. This project has been approved by the City of Helena, Lewis & Clark County, and the Montana DOT and was completed in 1993 (Robert Peccia & Associates 1992). The Warren curve realignment project was concluded in late 1992.

An increase in the frequency of snow plowing by Lewis & Clark County may be required (especially on Lake Helena Drive and Deal Lane) in order to prevent heavy winter snows from limiting access along the haul route. Where snow-related delays close the Site E haul route for more than three days, capacity at the Helena Transfer Station could be exceeded. Additionally, Prickly Pear Creek can flood during heavy storms. An emergency alternative route could be used to bypass the Prickly Pear Creek bridge, however. (Such a route could include Canyon Ferry Rd. to Lake Helena Drive, for example.)

4.9.1.2 Regulatory Requirements

Conflicts with regulatory requirements are not anticipated since the only requirements for waste hauling concern proper vehicle use and permitting. Appropriate uses of waste-hauling vehicles have been discussed. Montana Public Service Commission maintains jurisdiction over permitting.

4.9.1.3 Irreversible or Irretrievable Commitment of Resources

Irreversible or irretrievable commitments of resources would be limited for any alternative site, and would be similar for all sites. These could include irreversible alteration of the natural landscape due to access road construction, although reclamation should be able to return these areas to the pre-landfill condition. Road and bridge development and upgrading could conceivably alter stream morphology where crossings are made.

4.9.1.4 Cumulative Impacts

Cumulative impacts were incorporated into the short-term and long-term projections, as they were based on traffic increases which considered population increases, healthy economic growth, and increased waste reduction, recycling, and reuse.

4.9.1.5 Potential Mitigation Measures

Several mitigating measures were described in the previous paragraphs. Another measure is adherence to legal load limits, since baseline road conditions may deteriorate if the truck weight exceeds the weight limit along the haul route. Truck weights should also be monitored to prevent negative impacts in the form of road degradation. The total weight could be limited to 450 pounds/tire-inch, or 300 pounds/tire-inch during spring conditions (Montana DHES 1991).

4.9.2 Site A

4.9.2.1 Direct and Indirect Impacts

As shown in Table 4.9-1, the addition of 7 round trips to Site A over the short-term represent a small increase in vehicular traffic for the majority of all three scenarios (Scenario 1, 2 and 3 haul routes were described in section 3.9.2, and shown on Table 3.9-3). Traffic volume would increase by less than 0.34 percent along any haul route, with the exception of Smelter Road, where traffic would increase by approximately 3.6 percent. (Referring to Table 3.9-1, it is apparent that this increase is due to the low baseline traffic levels currently observed.) Over the long-term (Table 4.9-2), projected overall traffic would increase from 0.07 (Interstate 15) to 1.33 (Smelter Road) percent. The addition of 10 round trips would not dramatically increase traffic along the majority of the Site A haul routes.

According to the Helena Urban Transportation Plan (Table 3.9-1), there are four locations along the Site A/Scenario 1 haul route that are presently experiencing traffic congestion problems. Of those, three are expected to decrease to LOS F, and would therefore be significantly impacted by the use of this haul route. Several locations along the Site A/Scenario 2 haul route are currently experiencing congestion problems. Of those, six would operate at LOS D or less (Robert Peccia & Associates 1992). Two intersections along the Scenario 3 haul route are currently operating at LOS C. Over the long-term, this rating would decrease to LOS D and F. Use of this route would significantly impact those locations in the next 20 years. These impacts could be reduced, however, if truck trips were scheduled to avoid using the haul route during peak traffic hours in the morning and afternoon/evening.

Three (Scenario 3) to 14 (Scenario 2) high-accident locations would be encountered by haul trucks using the Site A haul route scenarios listed on Table 3.9-3. Since the proposed project would create additional truck traffic at these problem intersections, the risk of accidents would increase and the rate of accidents could potentially increase. The Site A/Scenario 1 haul route could have an increased risk of accidents and injuries where the route passes Carroll College and Memorial Park due to large numbers of pedestrians, bicyclists, and motorists going to and from those facilities. Under Scenario 2, the risk of accidents and injuries to pedestrians and cyclists could increase where the route passes Helena High School. Under Scenario 3, there would be an increased risk of accidents and injuries to pedestrians, cyclists, and motorists where the route passes the Four Georgians School. This concern could be reduced if solid waste haul trips were scheduled to avoid the times when students are travelling to and from school.

Road improvements necessary for the construction and safe operation for a landfill at Site A include an access road, constructed of a crushed gravel base and chip seal. Heavy winter snows could temporarily limit access along the Site A haul route along Smelter Road, where deep snow drifts can form. It is expected that an increase in the frequency of snow plowing by Lewis & Clark County would prevent snow-related delays that exceed the capacity of the transfer station.

4.9.2.2 Regulatory Requirements

Applicable regulatory requirements are as discussed in section 4.9.1.2.

4.9.2.3 Irreversible or Irretrievable Commitment of Resources

The commitment of quality resources is as discussed in section 4.9.1.3.

4.9.2.4 Cumulative Impacts

Applicable cumulative impacts are as discussed in section 4.9.1.4.

4.9.2.5 Potential Mitigation Measures

Applicable mitigating measures are as discussed in section 4.9.1.5.

4.9.3 CCSS Landfill

Since the haul route scenarios identified for the CCSS Landfill site are identical to those for Site A from the City of Helena transfer station to Highway 12/287 at Smelter Road, only the portion of the haul route that is unique to the CCSS landfill site will be discussed in this section. That portion includes Highway 518, which connects to the CCSS landfill access road.

4.9.3.1 Direct and Indirect Impacts

For the CCSS haul route, overall traffic would increase by 0.10 to 1.31 percent (Table 4.9-1). The addition of seven round trips that would be experienced with the proposed project being used at CCSS landfill represents a small increase in vehicular traffic over the short-term for the majority of the route. Over the long-term (Table 4.9-2), projected overall traffic would increase from 0.07 to 1.11 percent (Smelter Road would not be part of the CCSS haul route). The addition of 10 round trips would not substantially increase traffic along the CCSS haul route. Areas with traffic congestion and accident problems are the same as those described for Site A/Scenarios 1, 2, & 3 in section 4.9.2. The projected LOS for all of the intersections are C or worse by the year 2010, and five of the intersections are predicted to be LOS F. All are expected to be significantly impacted by additional landfill traffic.

The existing access road will require rehabilitation including a crushed gravel base and chip seal. It is also expected that the road will have to be lengthened to accommodate an expansion of the CCSS landfill. Snow-related problems discussed in section 4.9.2. apply to the CCSS site. As Highway 518 is a state road, however, it is expected that the Montana DOT will provide maintenance.

4.9.3.2 Regulatory Requirements

Applicable regulatory requirements are as discussed in section 4.9.1.2.

4.9.3.3 Irreversible or Irretrievable Commitment of Resources

The commitment of quality resources is as discussed in section 4.9.1.3.

4.9.3.4 Cumulative Impacts

Applicable cumulative impacts are as discussed in section 4.9.1.4.

4.9.3.5 Potential Mitigation Measures

Applicable mitigating measures are as discussed in section 4.9.2.5.

4.9.4 Modifications to the Proposed Action

The primary transportation impacts that are likely to result from recycling efforts include truck trips between the transfer station and the vendor for the recyclable items. At this time it is not possible to know which haul routes would be used, or the frequency of these trips. However, the overall trips between the transfer station and the landfill would be reduced by the number of recyclable loads, as these represent a direct diversion of wastes previously destined for the landfill. Some additional traffic could result from individuals transporting recyclables to the transfer station, but this impact is not known. The recycling pickup program instituted within Helena would reduce this traffic.

No transportation impacts should occur due to composting, as compostable material would most likely be collected at the transfer station and hauled to the landfill in the same manner as non-compostable (and non-recyclable) materials. As discussed above, the number of overall trips between the transfer station and landfill should not differ from a system with no composting facility. Return truck trips from the landfill could carry mature compost to the transfer station or another base for distribution. The volume of these materials was considered in the short- and long-term daily trip calculations discussed earlier in this section.

4.9.5 No Action Alternative

Under this alternative, solid waste would be hauled from the transfer station to a landfill outside of the Helena Valley. Solid waste haul trips would use portions of the haul routes previously described. The specific roads that would be used would depend on where the waste would be hauled. If the waste were hauled north along Interstate 15 out of the Helena Valley (toward Great Falls), the trucks would use the Site E haul route and Washington Street to Interstate 15 (until and unless a highway exchange is constructed at I-15 and Custer Avenue; Custer would provide a much shorter and easier distance to the highway in this instance). Another possibility for waste transport to the north would be to follow Montana Avenue to Lincoln Road, east on Lincoln Road to the I-15 entrance ramp. Transport to a facility in Missoula would require trucks to travel west on Euclid and Highway 12 out of Helena. (These roads have not been evaluated as part of this analysis, and a review of traffic, congestion, and accidents may be required once the facility to be used is identified.)

Lesser impacts on local snow plowing services would be observed than with the other alternatives, as secondary roads such as Smelter Road, Lake Helena Drive, and Deal Lane would not require higher priority service. In addition, the need for substantial road improvements would be eliminated, saving money and time. The accident potential along the alternative haul routes would not be increased. However, jurisdictions outside of the Helena Valley would experience many of the impacts described for the various alternatives. Traffic would increase slightly, accident risks could increase, roads could be degraded, and the County's liability for proper solid waste management could be increased. Of course, costs associated with trucking waste to a facility out of the study area would increase. These factors are further discussed in section 4.12.

4.10 RECREATION AND LAND USE

Evaluations presented in this section were developed based on an understanding of the recreational activities and land uses occurring in the study area. Information sources included the HNF Forest Plan (U.S. Department of Agriculture 1986) and visitors map, the Lewis & Clark Comprehensive Plan (1989), field reconnaissance, and communications with the Montana Department of Fish Wildlife & Parks (DFWP), and the County Planning Department. This section presents site-specific impacts for each of the alternative sites. Figure 1.1-1 showed some of the prime recreational areas in the valley, including Hauser Lake, Lake Helena, and the Regulating Reservoir.

Direct effects to recreational resources will occur if landfill development at any of the alternatives results in the termination of use or modification of recreational resources within the study area. Indirect effects would occur if operational activities affected recreation use patterns, recreation demand, or access to use areas.

Considerations used to identify effects to recreational resources included project-related changes that:

- Alter or otherwise physically affect established, designated, or planned recreational areas or activities
- Affect officially adopted policies or goals for recreation management of recognized organizations or agencies
- Increase or decrease accessibility to areas established, designated or planned for recreational use
- Affect the duration, quantity or quality of recreational resources

Direct effects to land use resources would occur if landfill development results in the termination of an existing land use in the project area. Indirect effects would occur if the project resulted in altered land use patterns or access to use areas adjacent to, or within view of the project area.

The following criteria were used to evaluate impacts to land uses:

- Potential conflicts with county land use plans
- Proximity to sensitive areas (residential and recreational)
- Termination of an existing land use
- Changes that altered the quantity or quality of nearby land uses

4.10.1 Proposed Action - Site E

4.10.1.1 Direct and Indirect Effects

There are no recreational facilities or uses associated with Site E. Therefore, no direct effects to recreational resources are expected as a result of landfill development in this area.

Indirect effects would occur if visibility of the project caused a reduction in the quality of the recreational experience to users of recreation areas such as Hauser Lake, Lake Helena, the Regulating Reservoir, Canyon Ferry Lake, a nearby golf course, and HNF. Recreationalists also travel on York Road and Lake Helena Drive. Intervening topography and visual screens (vegetation around Lakeside Resort and the Regulating Reservoir) block most views of the site from the identified recreation areas. It is possible to view small portions of Lake Helena and a very small area of Hauser Lake from Site E. Although boaters on these waters would be able to see some of the area, the view distance and a typically short duration of view would keep the landfill from detracting from the recreational experience. The site is not visible from Canyon Ferry State Park. Views of the site from locations within the HNF would be from six miles away or farther. A landfill at Site E would not be a dominant element in the overall view of the Helena Valley from those distant and elevated vantage points.

A Site E landfill would not likely contain sharp contrasts in color, or large man-made structures, which typically are the elements of a project that stand out from a distance. Recreationists travelling on the York Road will, at times, have partial views of the site. Although viewing scenery from a roadway is an important recreational activity, Site E does not represent an important visual resource. Overall, indirect impacts to recreation activities or uses is expected to be minimal.

Site E has historically been dryland farmed. The operation of a landfill would terminate this land use. The loss of this acreage would not represent a significant decrease in the total amount of farmland of this type in Lewis & Clark County, however. Adjacent land uses are predominantly agricultural, although there is some residential development along Lake Helena Drive and on Deal Lane. A landfill on this site would introduce an industrial activity to the area. Such a use would not interfere with the operation of the surrounding agricultural land, but is generally not compatible with residential development. Most existing and planned residential development is adjacent to Lake Helena Drive, however, where project visibility would be low. The existing transmission line right-of-way would not be affected by the operation of the landfill, as long as access to the towers is kept open.

The Lewis & Clark County Comprehensive Plan indicates that preservation of agricultural land within the Helena Valley is one of the county's planning goals. The proposed landfill, which would take a small amount of dryland acreage out of production, is generally compatible with surrounding agricultural activities. Recreational and residential development typically present more of a conflict with adjacent agricultural land uses.

Indirect effects to existing or planned land uses in proximity to the site are expected to be low. An exception to this evaluation are nearby residences, which would have views of the proposed landfill. These include the residences near the site on Deal Lane. Lands surrounding the site, which may have a view of the proposed landfill, could lose some of their attractiveness and real property value for future residential development.

4.10.1.2 Regulatory Requirements

The operation of a landfill on the sites considered would not conflict with any known federal, state, or local regulations regarding recreation or land use.

4.10.1.3 Irreversible or Irretrievable Commitment of Resources

Agricultural or grazing use of the sites would be lost for the life of the project. The type of land use occurring on the site after final reclamation has not yet been determined. The EA for this project (Montana DHES 1991) indicated that the land use could return to grazing. (Depending on the type of grazing, this practice may or may not be advisable, as the integrity of the final cover could be compromised by hooved animals.) Other possible uses include open space or park development. Some types of activities and land uses would likely be prohibited, such as those involving excavation into the subsurface or construction of facilities which impede the venting of landfill gases.

4.10.1.4 Cumulative Impacts

Other developments in the Helena Valley, including recreational and residential development that are planned or being built on lands which have previously been in agricultural production, would combine to lessen the amount of agriculture land use in the area. Expansion of industrial types of land use (such as this landfill) in the area would lessen the attractiveness of possible residential development in the surrounding area.

4.10.1.5 Potential Mitigation Measures

Measures identified for visual resources, in section 4.11.1.5, apply to the mitigation of recreational and land use impacts as well.

4.10.2 Site A

4.10.2.1 Direct and Indirect Effects

No recreational facilities or uses are associated with Site A. Therefore, no direct effects to recreation would be expected with the operation of a landfill at this site. There are no major recreation use areas or facilities in the surrounding area that would be indirectly affected by a landfill operation at site A. Use of the Smelter Road by joggers and bikers may occur to a limited extent. The presence of a landfill and associated increase in truck traffic (approximately 7 to 10 round trips/day as discussed in section 4.9) would lower the quality of the recreational environment for those users.

The existing land use is agricultural, and consists of mostly grazing and dryland grain farming. The operation of a landfill would terminate this use, which would not represent a significant loss to Lewis & Clark County. Site A is located 1 to 1½ miles south of the City of East Helena, and ½ miles north of residential developments (both existing and planned) located south of Smelter Road. Although intervening topography blocks views of most of the site, the operation of a landfill in such close proximity to residences may lower the quality of these residents' immediate environment. However, a new landfill would not be the only industrial development in the area. The ASARCO smelter is about 3/4 miles to the northeast of Site A, and is very visually evident. There is also a transmission line right-of-way and an interstate highway to the south and west of the site, respectively. Indirect effects to existing and planned land uses in the area are expected to be low.

4.10.2.2 Regulatory Requirements

Applicable regulatory requirements are as discussed in section 4.10.1.2.

4.10.2.3 Irreversible or Irretrievable Commitment of Resources

The commitment of quality resources is as discussed in section 4.10.1.3.

4.10.2.4 Cumulative Impacts

Applicable cumulative impacts are as discussed in section 4.10.1.4.

4.10.2.5 Potential Mitigation Measures

Applicable mitigation measures are as discussed in section 4.11.1.5.

4.10.3 CCSS Landfill

4.10.3.1 Direct and Indirect Effects

No recreational facilities or use areas exist on, or surrounding the site. Direct or indirect impacts to recreation resources are not expected with expansion of the existing CCSS landfill.

The site is currently being used as a landfill. Adjacent land uses are mostly agricultural, with some residential development along State Highway 518 and in the area between State Highway 518 and Interstate 15. Impacts associated with an expansion of the CCSS Landfill would represent an incremental increase to the existing disturbances. These impacts would generally be the result of increased visibility. Expansion of the existing landfill would not represent an introduction of an industrial land use to the area, because of the existing operation, the ASARCO smelter, and mining operations in the area. As with the other sites, expansion of the landfill would generally not interfere with the surrounding agricultural land uses.

4.10.3.2 Regulatory Requirements

Applicable regulatory requirements were discussed in section 4.10.1.2. Jefferson County has passed an emergency zoning ordinance for an area of northern Jefferson County that includes the existing CCSS Landfill (Jefferson County 1992 & 1993). Expansion of the existing landfill would not be an allowed activity under the guidelines set forth in the emergency zoning ordinance. The authority to enforce this ordinance is not known.

4.10.3.3 Irreversible or Irretrievable Commitment of Resources

The commitment of quality resources is as discussed in section 4.10.1.3.

4.10.3.4 Cumulative Impacts

Applicable cumulative impacts are as discussed in section 4.10.1.4.

4.10.3.5 Potential Mitigation Measures

Applicable mitigation measures are as discussed in section 4.11.1.5.

4.11 VISUAL RESOURCES

The assessment of visual impacts was based upon methodologies described in the Visual Contrast Rating Handbook (U.S. Department of Interior, BLM 1986a). Effects to visual resources were assessed for both on-going operation and post-closure maintenance of the proposed landfill.

The extent to which landfill development would affect visual resources depends upon the amount of contrast created between the proposed landfill operation and existing landscape elements (form, line, color, texture) and features (land surface, water surface, vegetation, structures). Assessing the projects impact in this manner identifies potential impacts and helps guide mitigation measures.

Impacts has been interpreted to exist if the following landscape modifications would occur:

- Quality of any scenic resource
- Scenic resources having unique or rare value
- Views from designated or planned parks, wilderness, natural areas, or other visually sensitive land uses
- Views from travel routes
- Views from established or planned recreational, educational, or residential areas

4.11.1 Proposed Action - Site E

4.11.1.1 Direct and Indirect Effects

Site E is located in an area of gently rolling dryland farmland, with little variation in landform or in the color or variety of vegetation. Contrasts to the existing landform will be created by the excavation of landfill cells and by soil stockpiles. The color and form of stockpiles, if contoured correctly, would not be dissimilar to those colors and forms found in the surrounding landscape. The regular, straight lines created by excavation would contrast with the generally undulating lines and forms of the existing topography. The introduction of man-made structures will be minimal, and will consist of a scale and scale building, a compactor, and a parking area (Damschen & Associates 1990a). These facilities will create moderate contrasts to the existing landscape scene, but are not at a scale that would draw the attention of the casual observer. The activities associated with the operation of the landfill such as truck traffic and the operation of the heavy equipment used to compact and cover the waste will draw the attention of those observers within the foreground distance (up to approximately ½-mile), who have views of these activities.

Sensitive viewing locations in proximity of Site E include residences and a golf course along Lake Helena Drive; residences along Deal Lane; travellers using York Road, Lake Helena Drive and Deal Lane; and recreational-use are as at Lake Helena, Hauser Lake and the Regulating Reservoir; and elevated areas, including HNF. Intervening topography, visual screens, and distance make any potential impacts from most of these locations minimal. Exceptions to this are residences on Deal Lane that are in close proximity to the site, and motorists passing the landfill on Deal Lane.

Litter escaping from landfills is also a common problem. Mitigation measures including litter fencing and frequent inspection of grounds and litter collection, would reduce these problems.

Once the landfill is closed, it would be revegetated and most daily activities would cease. Once successful reclamation and revegetation has occurred, the scenery of the site should return to near its existing condition.

4.11.1.2 Regulatory Requirements

The operation of a landfill at this site would not conflict with any known federal, state, or local regulations regarding visual resources.

4.11.1.3 Irreversible or Irretrievable Commitment of Resources

The scenery of the site would be affected for the life of the landfill. Reclamation would not establish the same landform as currently exists, but should be similar in form and appearance.

4.11.1.4 Cumulative Impacts

The development of a landfill at this site would change the scenery of the site from agricultural to industrial for the life of the project. Other developments in the area, including recreational and residential development, would combine to lessen the occurrence of this type of agricultural setting.

4.11.1.5 Mitigation Measures

For reducing visual contrasts, mitigation measures based on the concepts of minimization of disturbance, strategic location, and repetition of the basic elements (form, line, color and texture) can be employed. Depending on the facility or activity, the following measures can be used:

- Any structures should be painted a color that will blend in with the surrounding landscape (sage or light tan color is recommended for sites in this valley).
- Cut and fill for road construction should be minimized.
- Stockpiles should be graded to conform with surrounding landforms.
- Fencing should be used to control litter, along with a regular schedule for picking litter from fencing and other areas.
- Dust should be controlled with water or other agents.

- Where feasible, existing topography and/or berms created from stockpiles should be used to screen operations from view.

- Vegetation plantings should be used as windbreaks and visual screens to block views of the site from sensitive viewing locations (the local conservation district or nursery can provide help with the selection of plants - windbreaks should be several rows deep, and contain mostly tall evergreen trees, such as Ponderosa and/or Austrian pines for maximum screening; most of the plants should be several feet tall when planted; some method of irrigation will be needed).

- During reclamation, final contours and revegetation should repeat the color, lines and forms of the surrounding natural landscape.

4.11.2 Site A

4.11.2.1 Direct and Indirect Effects

Site A is located approximately 1 to 1½ miles south of East Helena, on gently rolling agricultural land. The type of contrasts created by a landfill developed on this site are the same as those described in section 4.11.1.1. These contrasts include changes in landform, and changes in the type of activities occurring on the site that would attract the attention of those viewers with a clear line of sight.

Identified sensitive viewing locations in the area include residences south of the ASARCO Smelter Road, from cars by travellers on Interstate 15, the City of East Helena, and residences north of East Helena. Intervening topography and/or existing visual screens block the view of the site from most of the viewing locations. The south end of site A contains the highest elevations. These high points are the most visible from locations on the northern edge of East Helena and, more noticeably, from areas north of East Helena. Residential areas north of East Helena are generally 2 to 3 miles distant from the site, and although activities would be visible, would not dominate the attention of the viewer. South of the site and north of the Smelter Road, a high point in the terrain effectively blocks views of the site from the residences south of the Smelter Road and from motorists on Interstate 15. At some points along the Smelter Road, motorists would at times be able to view portions of the site; however, the duration of the view would be short.

4.11.2.2 Regulatory Requirements

Applicable regulatory requirements are as discussed in section 4.11.1.2.

4.11.2.3 Irreversible or Irretrievable Commitment of Resources

The commitment of quality resources is as discussed in section 4.11.1.3.

4.11.2.4 Cumulative Impacts

Applicable cumulative impacts are as discussed in section 4.11.1.4.

4.11.2.5 Mitigation Measures

Applicable mitigation measures are as discussed in section 4.11.1.5.

4.11.3 CCSS Landfill

4.11.3.1 Direct and Indirect Effects

The CCSS site is located approximately 1½ miles south of East Helena and ½ miles east of State Highway 518. Impacts associated with an expansion of the landfill would be similar to those visual contrasts identified in the previous sections, 4.11.1.1 and 4.11.2.1. The site is an existing landfill, and any visual impacts connected with expansion of the existing facility would represent an incremental increase to the existing disturbance.

Sensitive viewing locations include State Highway 518, residential development directly west of the site adjacent to State Highway 518, and areas in East Helena. Plans for increased residential development in the area south of Smelter Road, between Highway 518 and Interstate 15. Current operations are located in a small drainage where topographic enclosure prevents most of the operations from being seen. If expansion required operations to move to the hillside west of the current trenches, the project visibility would increase to viewers along Highway 518 and possible future residential areas west of Highway 518.

4.11.3.2 Regulatory Requirements

Applicable regulatory requirements are as discussed in section 4.11.1.2.

4.11.3.3 Irreversible or Irretrievable Commitment of Resources

The commitment of quality resources is as discussed in section 4.11.1.3.

4.11.3.4 Cumulative Impacts

Applicable cumulative impacts are as discussed in section 4.11.1.4.

4.11.3.5 Mitigation Measures

Applicable mitigation measures are as discussed in section 4.11.1.5.

4.12 SOCIOECONOMICS

The proposed landfill project would cause a variety of socioeconomic impacts within the study area. These impacts have been grouped into four categories:

- Ability of local government to properly dispose of solid waste

- Demand on local government services
- Fiscal conditions of local government
- Attitudes, opinions, and lifestyles of study area residents

These areas of potential impact will be described for each project alternative. However, due to similarities in the types of impacts that could be expected for each alternative, some concepts are explained in detail only for the first alternative, Site E. Specific differences between the Proposed Action at Site E and the other alternatives are provided in appropriate sections.

The Lewis & Clark County Landfill would be operated by the Scratch Gravel Landfill District, which is a subunit of Lewis & Clark County. The District would continue to provide management of solid waste for the southern (or Helena Valley) portion of the County that encompasses the service area for this landfill. The District would incur the debt necessary to construct, operate, and eventually close the County landfill, and also collect the sanitation fees necessary for debt service.

Implementation of the proposed project, whether at Site E, Site A, or the existing landfill, would benefit Helena and Lewis & Clark County by enabling proper disposal of solid waste generated by local residents in an environmentally sound manner. Current disposal is provided by the city of Helena, Scratch Gravel, and the High Plains (Great Falls area) landfills. Neither of the facilities in Lewis and Clark County are lined or equipped with leachate collection systems. Both the City and Scratch Gravel facilities also have ground water contamination problems, which will likely continue at least until leachate generation ceases and natural contaminant degradation is complete. Therefore a new (Sites E or A) or expanded (CCSS) landfill, to include state-of-the-art environmental protection systems, would serve to minimize future contamination. Additionally, each of the existing landfills is near capacity and expected to close in the near future. Without a new landfill in the Helena Valley, the City and District would have to haul solid waste to distant locations at an increased operating cost (Hill 1993). The High Plains landfill operated by Waste Management of Montana, Inc. near Great Falls is currently upgrading its operation to comply with the Subtitle D and revised state rules. The High Plains Landfill has a current disposal area of approximately twenty-two (22) acres, the latest developed cell (approximately 3 acres) within that disposal area has a three (3) foot thick compacted soil liner and a leachate collection system. Both state and federal rules allow this 22 acre disposal area to continue to be used without requiring the area be retrofitted with a liner and leachate collection system as required under current design criteria. Any new disposal areas will be considered a lateral extensions and will be required to meet the design requirements of the Subtitle D and the state rules (see section 2.1.2).

From a regulatory standpoint, Lewis & Clark County must cease using the Scratch Gravel landfill in the next year unless compliance with Subtitle D is achieved. Compliance includes costly upgrades and remediation efforts. Additionally, the new state regulations parallel the federal requirements and require compliance or closure of the landfills soon after Subtitle D's effective date of October 1993 or April, 1994 for landfills accepting less than 100 tons per day for some criteria (refer to section 2.1.2). New or expanded landfills, in compliance with mandated federal and state regulations, should provide the best protection for the environment reasonably available at this time. In addition to stringent design requirements, such a landfill would be properly sited; constructed with a comprehensive quality assurance program; and managed with controls for air, noise, and litter.

Finally, the development of new landfill capacity would allow the County to evaluate other integrated waste management options, such as recycling and composting, that would minimize landfill disposal and associated costs, while extending the life of the facility.

For the analysis of project-related impacts on local government fiscal conditions, qualitative cost estimates for landfill construction, operation, and closure at each of the three sites were developed. These estimates were based upon the cost analysis completed in the Phase II Siting Study (Damschen & Associates 1990b); conversations with Lewis & Clark County and Helena officials; current literature values, and professional engineering judgements. The cost estimates presented in the following sections are considerably higher than those presented in the 1990 report. Rationale is discussed in some detail in section 5.3, but the reason for the large difference is primarily due to environmental protection systems that were not required prior Subtitle D. It is also important to note that costs were calculated for ultimate build-out at each alternative site, even though it is likely that construction would occur in phases over the life of the facility. Qualitative costs for Alternatives 4 and 5 are also discussed at the end of this chapter.

Costs of developing, constructing, and operating a landfill to service the solid waste disposal needs of the residents of the City of Helena, City of East Helena, and the Scratch Gravel Refuse District are shown for Site E, Site A, City-County Sanitation Service landfill, and the option of transporting waste out of the County under the No Action Alternative in Tables 4.12-1 and 4.12-2. The cost estimates presented in these tables were developed after review of available publications and reports on generic landfill development, construction, operational, closure, and post closure costs under Subtitle D requirements. Many of the projected costs are presented as a high-low range since the costs of construction or operation of these facilities is dependent on site specific characteristics and many variables that are not available at this time. The references utilized in this review were Damschen 1990b, Glebs 1988a & 1988b, Glebs and Juszczyk 1990, Gershman, Brickner, & Bratton, Inc. 1992, Woodward-Clyde 1991, Blue Ridge Services 1991, Prunty 1993, Repa 1990, Spear 1991, SWANA 1991, Walsh 1990a & 1990b, and Damschen and Associates 1993b. The capital and operational costs are listed under Sections A and B in Table 4.12-1, respectively. Transportation costs for all alternatives are shown in the table under item E to allow a reader to have a means of comparison although these costs are not necessarily paid by the landfill operator. Construction costs are tabulated in Table 4.12-2 for inclusion in the capital cost section (A) of Table 4-12-1.

Construction costs for a landfill included in Table 4.12-2 consist of the following elements for Sites E and A. The CCSS alternative and the No Action alternative list no construction costs because these would be incurred the private owners and would be recover in the tipping fee charged to users of the facility. Comparison of costs of these alternatives to Site E and Site A alternatives must be done in Sections D and E of Table 4.12-1 which break down the costs to consumers per ton of waste for disposal (Section D) and for disposal with transportation (Section E). The costs of installing a liner, leachate collection system are shown for the entire proposed sites as a lump sum although installation of these protective systems would be done in a phase process over the entire projected 50 year active life of these facilities. The same is true of the Final Cover/Closure Systems which consist of the protective final cap over the disposal areas with methane venting, topsoil, and reseeding of these areas. The range of costs for these systems is rather large due to the variation that can occur due to factors such as on site availability of suitable clay versus the cost of off site excavation and transport or amending on site soils with bentonite clay. Surface water controls such as diversion ditches and sedimentation ponds required by the rules are covered under Runon & Runoff Control Systems. Installation of monitoring wells for both ground water and methane gas are shown in this category. The costs of the already installed ground water monitoring wells at Site E are not included in this number, but are included in Table 4.12-1, Section A under Predevelopment Activities. Construction of buildings, access roads, entrances with signs and gates, and installing the necessary utilities are all included in this table. The total construction cost derived for these facilities in Table 4.12-2 is then include in Table 4.12-1 as a line item (Construction) under Capital Cost (Section A).

Section A of Table 4.12-1 covers the capitalization cost of developing a landfill over its active life. Construction cost are outlined above and broken down in Table 4.12-2. Site Acquisition is basically the cost of purchasing the property. The price of Site A is listed as the initial purchase price offer; the owner has indicated a willingness to negotiate alternatives such as trade or other compensation, however this price is the only firm number available for this analysis. Predevelopment Activities includes engineering, fees, and site characterization (i.e. ground water) that is required for the licensing process. For Site E this line item also include accrued interest on prior expenditures. Road improvements listed for Site E covers the County's commitment to pave and make general improvements to Lake Helena Drive and Deal Lane. A 10% contingency is provide for unexpected costs or costs overruns. These costs are totaled and then divided by the anticipated total waste capacity of the proposed sites (2,000,000 tons) to determine a Capital Cost per Ton figure.

Section B of Table 4.12-1 indicates the annual costs of operations of landfills at Site E and A. The CCSS and the No Action alternatives show a line item in this Section indicating the tipping fee for disposal of the projected 40,000 tons per year. The CCSS Landfill Alternative rate used ($37.60 per ton) was from the last bid (September, 1992) to the City of Helena from the owner of CCSS for a two-year contract to dispose of the City's waste (Sale 1992). The No Action Alternative cost uses the current rate under the City of Helena's two year contract (with options to extent to a period of 7 years) to utilize the Waste Management, Inc. owned High Plains Landfill near Great Falls (Waste Management 1993). Again all other costs listed in this section would be incurred by the operators of these facilities, but would be recouped in the tipping fees. However, both of these tipping fees are based on a short term contract of two years; it is likely rates could be lower for a longer-term commitment. O&M or operational and maintenance costs are indicated by a range. These include the basic costs of running a landfill such as equipment costs, labor, insurance/benefits, environmental monitoring, and leachate handling. This range is purposefully broad to encompass a variety of potential unknown possible costs. This includes the unknown quantity and quality of leachate that may be generated and collected at these facilities. The leachate would be required to be tested, transported, and properly treated. The volume of leachate needed to be handle could substantially increase current cost estimates used by the County (Damschen 1993). Future regulation requiring active control of landfill gas could also increase annual operating costs. These uncertainties mandated that the high end of the cost range be inflated over current projections. The same is true of the projected cost range for the Closure & Post-Closure Sinking Fund Payment or financial assurance mandated by state and federal rules (effective April 9, 1995). This fund is required to provide the funds necessary to close out the largest area of disposal needing closure during the active life of the facility and the cost of providing the 30 year post closure care. The amount projected in this item anticipates building a trust fund over the active life of the facility, however the EPA has yet to promulgate the Subtitle D rule on financial assurance which provides a financial test for local governments which may reduce or eliminate this expenditure for the County. The Bond Interest line covers the cost of issuing bonds (fees and interest) during the life of the facility to fund the phased construction that is anticipated for these facilities. An annual license renewal fee is required of licensed solid waste facilities based on the volume of waste disposed of annually. The amount shown is what a facility that accepts 40,000 tons a year would be billed at this time. The items in this Section are totaled and divided by the projected 40,000 tons per year to yield a per ton figure for operation and maintenance costs.

Section C is the combined cost per ton of both capital and operation and maintenance and is labelled Estimated Disposal Cost Per Ton. Since each alternative considered required the solid waste to be transported varying distances, for comparison purposes Section D and E are included in Table 4.12-1 to quantify the costs for transportation of the wastes. Annual Transportation Cost itemized in Section D includes charges for hauling the different distances. This costs was determined by a per ton/mile costs applied to the distance from the Helena Transfer Station. The No Action alternative utilizes the contractual cost for hauling and the cost of renting the transport trailers. The other alternatives include the purchase cost of tractor and trailers by the City of Helena spread over a 10 year projected life. The total annual transportation cost is then divided by 40,000 tons to determine a per ton cost. Section E is the cost of disposal and transportation combined and is the best cost estimate for comparison of all alternatives.

As mentioned above, proposed regulations to control landfill gas emissions under the Clean Air Act could add additional cost. These regulations would require all municipal solid waste landfills to manage gas generated during the life of the facility. At a minimum, this is expected to include monitoring of gas emissions and, at a maximum, the installation and operation of a collection system. Preliminary estimates for a gas collection system for a landfill similar in size to Lewis & Clark County's range from $200,000 to $2,000,000 (Walsh 1993). As the fate of these regulations is unclear at this time, the costs for a gas management system have not been included in the estimates. Although the costs of management of gas under this regulatory scenario would most likely be similar for any alternative under consideration. The wide range of this estimate is due to the procedure to be followed to comply with the proposed regulation. Initially certain reports and modeling are required by a landfill to demonstrate whether additional gas controls are required or not (initial estimate $20,000). If the initial modeling fails to demonstrate that there is no need to add controls at this level or tier of analysis, the facility is require either to install controls or conduct additional testing and demonstration at more cost. There are three levels of demonstration available at progressively more costs. If active gas controls are necessary the estimate of installation of this technology if from $500,000 to $3,000,000 (Walsh 1993), but is very dependent of site size and conditions. An 80 acre site would likely cost in the lower middle of this range. Operation of this type of technology is estimated at 10% of installation costs (Walsh 1993). As mention above, the contingency amount and the broad range of estimated O & M costs potentially could absorb these additional costs.

It is difficult to precisely gauge the significance to the public of some of the adverse socioeconomic impacts. Opinions vary on subjects such as impacts to property values and quality of life. Potential impacts have been identified below. Monetary values have been estimated for fiscal impacts on local

TABLE 4.12-1

ESTIMATED CONSTRUCTION, OPERATION, AND TRANSPORTATION COST SUMMARY (1993 Dollars)

	SITE E	SITE A	CCSS	NO ACTION (export waste to Great Falls)
Acreage	80	80	60	---
Projected Life[1] (Years; Table 2.1-3)	50	50	38	7
A. CAPITAL COST				
- Site Acquisition[2]	$127,000	$400,000	$0	$0
- Predevelopment Activities[3]	$366,000	$310,000	$0	$0
- Construction[4]	$7.5-$14.7 M	$7.6-$14.8 M	$0	$0
- Road Improvements[5]	$320,000	$0	$0	$0
- Contingency (10%)	$831,300-$1,519,300	$831,000-$1,551,000	$0	$0
TOTAL CAPITAL COST[6]	$9.1-$16.7 M	$9.1-17.1 M	$0	$0
TOTAL TONS WASTE CAPACITY[7]	2,000,000	2,000,000	1,520,000	280,000
CAPITAL COST PER TON[8]	$4.57-$8.36	$4.57-$8.53	$0.00	$0.00

TABLE 4.12-1
(Continued)

	SITE E	SITE A	CCSS	NO ACTION (export waste to Great Falls)
B. ANNUAL OPERATING COST				
- O&M[9]	$320,000-$600,000	$320,000-$600,000	$0	$0
- Tipping Fees[10]	$0	$0	$1,468,000	$638,000
- Closure & Post-Closure		$0		
Sinking Fund Payment[11]	$30,000-$100,000	$30,000-$100,000	$0	$0
- Bond Interest[12]	$142,000	$142,000	$0	$0
- State License Fees[13]	$16,000	$16,000	$0	$0
TOTAL ANNUAL O&M COST	$508,000-$858,000	$508,000-$858,000	$1,468,000	$638,000
ANNUAL O&M COST PER TON[14]	$12.70-$21.45	$12.70-$21.45	$36.70	$15.95
C. ESTIMATED DISPOSAL COST PER TON[15]	$17.27-$29.81	$17.27-29.98	$36.70	$15.95
ANNUAL TRANSPORTATION COST[16]				
- Trailer Rental[17]	$0	$0	$0	$6000
- Hauling[18]	$71,700	$46,300	$56,100	$440,000
- Transportation Equipment[19]	$16,000	$16,000	$16,000	$0
TOTAL ANNUAL TRANSPORTATION COST	$87,700	$62,300	$72,100	$446,000
ESTIMATED TRANSPORTATION COST PER TON[20]	$2.19	$1.56	$1.80	$11.15
E. ESTIMATED DISPOSAL & TRANSPORTATION COST PER TON[21]	$19.46-32.00	$18.83-31.54	$38.50	$27.10

TABLE 4.12-1
(Continued)

Key to Footnotes for Table 4.12-1

[1] Site E and A lifespans from Damschen & Associates 1990a; CCSS lifespan based on 1.6 acre/yr landfill usage rate for 40,000 TPY (Damschen & Associates 1990b); Great Falls lifespan based on Waste Management (1993 (contract).

[2] Based on past purchase price (Damschen & Associates 1990b) or asking price of entire parcel.

[3] Based on Damschen 1993b; includes accrued interest, engineering costs, and prior costs (i.e. licensing fees, ground water studies and well installation).

[4] Refer to Table 4.12-2.

[5] Based on Damschen 1993b (Site E) and Damschen & Associates 1990b (Site A).

[6] Rounded to nearest $100,000. This is the direct cost to the City/County for a new landfill under their jurisdiction. Both CCSS and the Waste Management landfill near Great Falls would expend a significant amount to upgrade these facilities, but the costs would be internal and passed on to users in tipping fees. See Estimated Disposal & Transportation Cost per Ton for comparisons (Row E).

[7] Based on average 40,000 tpy over projected life.

[8] Capital cost per ton to the City/County. CCSS or Great Falls facility capital costs would be passed on to City/County users through tipping fees.

[9] Operation & Maintenance; Derived from Glebs 1988, Woodward-Clyde 1991, Damschen 1993, Walsh 1990a, Prunty 1993, Repa 1990, and SWANA 1991.

[10] Based on $36.70/ton tip fee (Sale 1992) for CCSS and $15.95/ton tip fee (Waste Management 1993) for No Action alternatives; 40,000 tpy.

[11] Annual payment required to build a trust fund to comply with the financial assurance to cover costs for closure of active areas and post closure care. Derived from Damschen 1993, Glebs, 1988b, Glebs & Juszczyk 1990, Spear 1991, and SWANA 1991.

[12] Derived from Damschen 1993; Average interest on projected bonds for initial construction and first twenty year of life issued for liner and cap construction. Subsequent annual interest payments are likely to be less.

[13] Calculated from ARM 16.14.406 (Table 1). 40,000 tpy.

[14] Based on 40,000 tpy.

[15] Total obtained by addition of Capital Cost Per Ton and Annual O&M Cost Per Ton.

[16] This cost is included in the Helena Transfer Station cost and is not part of the County landfill expense. This cost was included in this table to provide a comparable cost for each alternative which factors in the varying cost of transporting waste to different locations.

[17] Waste Management 1993 (contract).

[18] Based on $0.163/ton-miles multiplied by one-way distance for round-trip hauling expenses (Hill 1993); average one-way miles for Sites E, A, and CCSS of 11.0, 7.1, and 8.6 respectively; Waste Management 1993 (contract) for No Action Alternative. Site E = 11 miles one way, Site A (7.1 average one way miles; 7.1 miles for Scenario 1, 6.3 miles for Scenario 2, 8.0 miles for Scenario 3), CCSS (8.6 average one way miles; 8.6 miles for Scenario 1, 7.8 miles for Scenario 2, 9.5 miles for Scenario 3).

[19] Nisbet 1993 (transportation vehicle and transfer station trailers purchased by City of Helena) total cost ($159,748.00) projected over anticipated 10 year use period.

[20] Based on 40,000 tpy.

[21] Obtained by adding Estimated Disposal Cost Per Ton and Estimated Transportation Cost Per Ton.

TABLE 4.12-2

ESTIMATED CONSTRUCTION COSTS (1993 Dollars)

CONSTRUCTION ITEM	SITE E 80 ACRES	SITE A 80 ACRES	CCSS[1] 60 ACRES	NO ACTION[2] (export waste to Great Falls)
Liner & Leachate Collection System[3]	$4.8-$8.0 M	$4.8-$8.0 M	$0	$0
Runon & Runoff Control System[4]	$50,000	$75,000	$0	$0
Groundwater Monitoring Wells[5]	$25,000 (approx. additional 3 wells)	$50,000 (approx. 6 wells)	$0	$0
Methane Monitoring Wells[6]	$5,000 to $10,000	$5,000-$10,000	$0	$0
Final Cover/Closure System[7]	$2.4-$6.4 M	$2.4-6.4 M	$0	$0
Buildings[8]	$80,000	$80,000	$0	$0
Utilities[8]	$10,000	$10,000	$0	$0
Access Road[8]	$80,000	$120,000		
Perimeter Fencing[8]	$40,000	$45,000		
Gate/Signs/Entrance[8]	$10,000	$10,000		
TOTAL CONSTRUCTION COST[9]	$7,500,000-$14,700,000	$7,600,000 - $14,800,000	$0	$0

[1] Funds for construction of CCSS expansion would be paid by owner. Users from Helena, Lewis & Clark County, and other areas will pay the construction costs indirectly through tipping fees (see Table 4.12-1, Estimated Annual Disposal Cost Per Household).

[2] Waste would be hauled to Great Falls and no investments would be made directly by Lewis & Clark County. As with CCSS, costs would be indirectly born by users through tipping fees (see Table 4.12-1, Estimated Annual Disposal Cost Per Household).

[3] Based on $60,000 to $100,000/acre for composite liner & LCS; Woodward-Clyde 1991 and Glebs 1988.

[4] Derived from Damschen & Associates 1990b and Damschen 1993b.

[5] Derived from Damschen & Associates 1990b, assuming approximately $8,300 per well.

[6] Derived from Damschen & Associates 1993b, Glebs 1988b, Glebs and Juszczyk 1990, and Prunty 1993.

[7] Derived from Damschen & Associates 1993b, Glebs and Juszczyk 1990, Repa 1990, Spear 1991, SWANA 1991, and Walsh 1990b.

[8] Derived from Damschen & Associates 1990b and Damschen 1993b.

[9] Costs are rounded to nearest hundred thousand dollars.

government agencies. A qualitative estimate of the possible reduction in property values and changes to the quality of life is also described.

4.12.1 Proposed Action - Site E

All Site E evaluations in this EIS have been based upon the construction and operation of the proposed 80-acre landfill only. This socioeconomic section also focuses only on the 80 acre site.

4.12.1.1 Direct and Indirect Effects

Construction of the proposed landfill at Site E would result in additional demands for various local government services. Utilization of Site E would result in increased District staffing requirements, some road improvements, a potential increase in road maintenance, and an increase in service by the Sheriff and Fire Departments. These additional demands represent a net increase in some services, but merely a transfer of demand for others.

In order to comply with the operating criteria of Subtitle D (refer to section 2.1.2), the District would likely increase staff or manhours. It is important to note that Subtitle D compliance would be required for all of the alternatives, including No Action. The increased demand for staff and related increase in operating costs at the District would occur regardless of which landfill site is selected.

Use of Site E would require road improvements to handle heavy trucks, and may result in increased road maintenance along the haul route (refer to section 4.9). The Lewis & Clark County Road Department would be responsible for providing those services along York Road, d

waste haul loads is monitored and kept below the legal weight limit, road damage and maintenance would be minimal.

Snow plowing services along the Site E haul route are currently adequate to meet the needs of landfill access. Typically, these roads are plowed the same day or the day after a snowfall (Ellis 1992). The Helena transfer station will have a winter capacity of three days. Thus, even if the Site E haul route were closed due to snowfall for one or two days, there should be no significant solid waste management problem.

Fire protection services for Site E would result in a new demand on the Lakeside Volunteer Fire Department. Increased patrols by the Lewis & Clark County Sheriff's Department may also be required along Deal Lane to discourage or prevent unauthorized access to the landfill, and to enforce the covered load requirements for waste haulers. This increase in the demand for fire and sheriff's department services would not result in a measurable net increase in service-related costs --- the demand for these services would virtually be eliminated at the Scratch Gravel Landfill following closure. The net effect on Lewis & Clark County fire and sheriff services would likely be a shift of demand for services, not an increase.

Construction and operation of a landfill at Site E would require a substantial financial investment by the Scratch Gravel Landfill District (for facility development). This investment would include site acquisition, construction, landfill operation and maintenance, and eventual site closure and post-closure activities. These costs, including those for the other project alternatives, are presented in Table 4.12-1.

Site E was purchased by the Scratch Gravel Landfill District in 1990 after the landfill siting studies were completed. The purchase price was $126,596.14. The District paid for the site by borrowing funds from the County Capital Development and County Health funds. At present, the Scratch Gravel Landfill District is paying interest on this borrowed money at the rate of 10 percent (DeHart 1992). Prior to its purchase, Site E was vacant and used primarily for agriculture. By removing Site E from private ownership, the site is no longer generating property tax revenue for the county. The property tax assessed annually on the entire site prior to its purchase was only $125.72, however (Tetratech 1990). Utilization of this property for a landfill would therefore not significantly reduce property tax revenue in the County.

Construction costs consist primarily of liner and leachate collection system installation for all disposal areas, establishment of runon/runoff controls, ground water and gas monitoring well installation, and the closure of all disposal units including final cover. The District would be responsible for funding construction. The associated construction costs for the life of the project are estimated to range from $7.5 to 14.7 million (refer to Tables 4.12-1 and 4.12-2).

Road improvements for Lake Helena Drive, Deal Lane, and the access road are calculated to cost approximately $320,000. One solid waste haul tractor and two trailers have been purchased by the City of Helena to transport waste to a landfill. The cost of these trucks and trailers was $159,748 (Nisbet 1993).

The total capital costs for developing a Site E landfill are an estimated $9.1 to $16.7 million, which translates to $4.57 to $8.36 per ton of waste. This value includes a 10 percent contingency factor for such items as legal and engineering fees, miscellaneous expenses, and unforeseen cost overruns.

Annual landfill operation and maintenance (O&M) costs include labor, administration, insurance, and utilities; equipment purchase, operation, and depreciation; waste screening and placement, compaction, and covering; monitoring well testing, leachate management, and site O&M; and other miscellaneous expenses. Closure of a Site E landfill would include final grading, capping, and vegetation. Post-closure activities would include monitoring of ground water quality, and leachate and gas monitoring and management for a period of at least 30 years. In compliance with Subtitle D, the District must provide financial assurance to guarantee that closure construction and post-closure monitoring and maintenance funds are available when the facility first comes on-line. Financial assurance is typically established by a bond, trust fund, letter of credit, insurance or other sinking fund mechanism.

The Scratch Gravel Landfill District would finance construction, operation, and closure/ post-closure financial assurance by borrowing money from the State of Montana Capital Improvement Fund and local area banks at an interest rate ranging from 5 to 6 percent (Blackmon 1992), instead of using the County's own general funds. As a result, the project would not compete with other county programs or facilities (such as the county library and weed district) for funding.

It is worth noting that closure and post-closure costs are especially difficult to estimate due to the lengthy time periods and uncertainty of interest and inflation rates. Calculations developed for this EIS have been based on closure and post-closure occurring in 50 years, which is also the expected lifespan of Site E, Site A, and a somewhat shorter lifespan than that anticipated for the CCSS Landfill. This will minimize to some extent the significant margin of error associated with financial projections, and will provide a better basis for comparison with Site A and the CCSS Landfill alternatives. The total annual O&M costs for a Site E landfill are estimated to be $508,000 to 858,000, or $17.27 to $21.45 per ton. The annual transportation cost for Site E is estimated at $87,700 or $2.19 per ton. Therefore, the estimated total cost for disposal and transportation for Site E is $19.46 to $32.00 per ton (Table 4.12-1).

Ultimately, the Scratch Gravel Landfill District and City of Helena would recover the costs of the landfill through collection of sanitation service fees and/or assessments from the residences and businesses within the service area. One way to view the cost to individuals using a Site E landfill is to assume equitable payment between residential and commercial users on a per ton cost. The estimated cost per ton of solid waste for transportation and disposal at Site E is estimated to be $19.46 to $32.00. While this cost estimate does not necessarily represent the actual cost of operation, it does provide some insight to the economic impact of a new landfill at Site E. The County's consultant has prepared cost estimates for the development and operation of a landfill at Site E (Damschen 1993; see Appendix B). This analysis contains an estimated average cost of operation for the Site E landfill at $24.50 per ton. Using these figures the Scratch Gravel Refuse District Board has set a per ton disposal rate for the District at $22.50 per ton for the District. The revenue from interest is anticipated to offset the difference.

The attitudes, opinions, and lifestyles of residents served by or within the vicinity of the landfill may change as a result of landfill development at Site E. Impacts may occur from visual, recreational, or transportation issues, as described in sections 4.9, 4.10, and 4.11. To some, these impacts may represent a reduction in the quality of life. Individuals living near Site E may be concerned that the landfill will reduce their property values. Opinions regarding this issue are conflicting. It is possible that property values would be lowered by blowing litter, strong odors, dust clouds, or loud noises observed at nearby properties. If these impacts were avoided or reduced due to effective mitigation measures, it is unlikely that property values would be affected at all. Homes located in the Helena Valley near the existing Scratch Gravel and Helena Landfills have experienced little or no reduction in property values due to operation of those landfills, with the exception of those homes affected by ground water contamination (Garret 1990). A study of property values surrounding a landfill in California (Bleich, Findlay, and Phillips 1991) found "a landfill, if well-designed and -managed, can be a good neighbor and have no statistically measurable negative impact on surrounding property values".

Conversely, some beneficial impacts to the quality of life would occur as a result of landfill development at Site E. These were described at the beginning of this chapter. Public support will be necessary to accomplish long-term solid waste disposal needs that are managed at a well-designed, well-operated landfill that protects the environment and public health.

4.12.1.2 Regulatory Requirements

No federal, state, or local requirements exist that directly govern socioeconomic issues associated with landfill development and operation, with the exception of the financial assurance requirement of Subtitle D (Subpart G). It is expected that compliance with this subpart would be achieved prior to operating a landfill at Site E. This EIS serves as the basic planning and regulatory review of socioeconomic impacts.

4.12.1.3 Irreversible and Irretrievable Commitment of Resources

No commitment of quality resources is expected, other than the presumably necessary expenditure of public funds to construct and operate the landfill.

4.12.1.4 Cumulative Impacts

A Site E landfill, when considered along with other development projects planned for areas northeast of Helena, is not expected to have significant cumulative socioeconomic impacts. The proposed landfill would not help reduce the ability of Lewis & Clark County or the City of Helena to provide necessary government services or fund important programs and facilities since it is anticipated that fees and increases user levies would provide the funds needed.

4.12.1.5 Potential Mitigation Measures

Potential mitigation measures that apply to the maintenance of property values and public support of this facility were discussed above.

4.12.2 Site A

4.12.2.1 Direct and Indirect Effects

Construction of the proposed landfill at Site A would result in an increased demand for various local government services provided in the portion of Lewis & Clark County near Site A. This increase would be generally equivalent to that described for Site E (refer to section 4.12.1.1).

However, unlike Site E, use of Site A would require only minor road improvements, primarily consisting of a new landfill access road. The use of Site A would result in the need for improved snow plowing services, however. Snow plowing along the Site A haul route is currently inadequate to meet the needs of landfill access. Smelter Road is considered to have major drifting snow problems (Ellis 1992).

Therefore, an increased commitment from Lewis & Clark County to keep access to the landfill open during severe snowfalls would represent a small net increase in demand for government services.

In general, the capital and O&M expenditures would be similar to Site E (refer to Tables 4.12-1 and 4.12-2). Total capital costs for Site A were estimated to range from about $9.1 to 17.1 million, or $4.57 to 8.53 per ton. Total O&M costs are projected to be $508,000 to 853,000, or $17.27 to 29.98 per ton. The estimated annual transportation cost is $62,300, or $1.56 per ton. Therefore the estimated disposal and transportation cost for Site A is $18.83 to $31.54 per ton (Table 4.12-1).

The slight differences in cost between Sites E and A are due to site acquisition and development. Site acquisition cost would be higher for Site A ($400,000). There would also be minimal variations in the surface water control system, ground water monitoring well requirements, and road improvement requirements. Transportation cost is less due to the shorter distance required for hauling the wastes.

4.12.2.2 Regulatory Requirements

Applicable regulatory requirements are as discussed in section 4.12.1.2.

4.12.2.3 Irreversible and Irretrievable Commitment of Resources

No commitment of quality resources is expected.

4.12.2.4 Cumulative Impacts

Applicable cumulative impacts are as discussed in section 4.12.1.4.

4.12.2.5 Potential Mitigation Measures

Potential mitigation measures are as discussed in section 4.12.1.5.

4.12.3 CCSS Landfill

4.12.3.1 Direct and Indirect Effects

Use of an upgraded CCSS Landfill for long-term solid waste disposal needs by Lewis & Clark County would result in impacts that differ from those for Sites E and A. The differences mainly arise from the fact that the CCSS Landfill is an existing, privately-owned facility, located within Jefferson County.

Upgrading and expansion of the CCSS Landfill would be generally equivalent to that described for Sites E and A. Specific governmental demands would be imposed and would result in a small increase in road improvements and maintenance. Additional sheriff and fire department services would also be required from Jefferson County. As a result, the use of the CCSS Landfill could be considered to have an adverse economic and infrastructure impact on Jefferson County's emergency response services. On the other hand, as a private entity, CCSS Landfill would return some funds back to the County through taxes and related employment benefits. Unlike Site E, use of the CCSS Landfill would require only minor improvements to the existing access road. Snow plowing services presently occur along the CCSS Landfill haul route and are generally adequate to meet the needs of landfill access.

In general, the types of capital expenditures required for an upgrade of the CCSS Landfill would be the same as for Sites E and A, although the amounts differ (refer to Tables 4.12-1 and 4.12-2). As the upgrade of this privately-owned facility would be constructed and operated by its owner, only the transportation investment (new vehicles) would be incurred by the City. No capital or O&M costs would be directly incurred by the District. However, it is important to note that the real cost to users would come in the form of tipping fees charged by the CCSS Landfill for waste disposal.

The owner would be expected to charge a rate necessary to recoup the costs for upgrade and expansion, plus charge operating costs and an unknown profit. As discussed earlier in this document, the owner of the CCSS facility has proposed an expansion plan which includes landfill upgrade and development in full accordance with minimum Subtitle D requirements. Cost estimates were not supplied for this EIS, but a proposal submitted by the facility owner and operator to the City of Helena and the Scratch Gravel Landfill District in February 1992, may provide some idea of their plans. Cost estimates were provided for short (2-year), medium (5-year) and long (10-year) service, which ranged from $32 per ton to $26.80 per ton (Proposal to City of Helena 1992). (The longer the service contract, the lower the unit cost). The recently publicized plans for facility expansion apparently increased these rates. The last bid submittal to the City of Helena in September, 1992 for a two year contract specified a rate of $36.70 per ton for disposal at CCSS Landfill (Sale 1992). This rate was used in Table 4.12-1 for a tipping fee for this facility.

With an estimated cost of disposal at $36.70 per ton the annual costs of disposing of 40,000 tons of solid waste would equal $1.5 million. The estimated annual transportation cost for the CCSS Landfill alternative would be $72,100 or $1.80 per ton. Therefore, the estimated total cost for disposal and transportation is $38.50 per ton (Table 4.12-1). As mentioned above this cost could vary depending on the terms of a negotiated contract or other factors concerning the need to upgrade this facility to the new state and federal standards.

4.12.3.2 Regulatory Requirements

Residents of Jefferson County may object to providing emergency response services to the CCSS Landfill if it were used primarily by the Scratch Gravel Landfill District. Unless an additional tax or fee were levied on the landfill to cover the cost of public services, i.e. based on the volume of waste brought in from "outside" Jefferson County, the use of the CCSS alternative could be considered to have an adverse impact on Jefferson County. Additional regulatory requirements were discussed in section 4.12.1.2. In addition, previous sections of the EIS discussed the potential impact of Jefferson County's zoning prohibition on solid waste importation.

4.12.3.3 Irreversible and Irretrievable Commitment of Resources

No commitment of quality resources is expected.

4.12.3.4 Cumulative Impacts

Applicable cumulative impacts were discussed in section 4.12.1.4. It is likely that Jefferson County will need to upgrade existing facilities, construct a new solid waste management facility, or contract with a private facility, in the near future. The CCSS Landfill could provide a disposal service to Jefferson County as well. However, this development has not been planned or proposed as of yet, and impacts could not be evaluated in this EIS.

4.12.3.5 Potential Mitigation Measures

Mitigation of adverse economic and infrastructure impacts on Jefferson County could occur through a one-time payment, or annual payment, or use fee paid to Jefferson County to compensate for the increase in demand for services that would result from use of the CCSS Landfill.

4.12.4 Modification to Proposed Action

The potential impacts resulting from recycling and composting programs are primarily associated with surface water resources, noise, and transportation. These were discussed in sections 4.3, 4.5, and 4.9 respectively. Potential economic impacts are described below.

4.12.4.1 Recycling Program

A recycling program has already been initiated for Lewis & Clark County and the City of Helena. Under the "blue bag" program, city residents place recyclable materials, including tin, aluminum and newspaper, into blue trash bags and place them outside for weekly pickup with household garbage (Goroski 1993). City sanitation staff take the bags to the Montana Recycling Center for sorting and processing. However, glass and plastic are not recycled under the pickup program. Residents using the Scratch Gravel Landfill can take blue bags to the landfill where an employee will sort the contents and haul materials to Montana Recycling Center. Most recyclable materials will be able to be dropped off in bins at the transfer station facility.

The calculable economic impact of this program is not expected to be significant. It is possible that some revenue may be generated, especially in the case of aluminum, but use of the private vendor for storage, handling and transfer of the recyclables reduces the likelihood of a positive cash return. Also, costs and revenues are likely to vary over time as a function of the recyclables market. The anticipated economics of the blue bag program provide a good estimate of those which could be associated with the transfer station facility.

During the first stage of the blue bag program, only residences will be served. Participation is expected to remain low enough that an increase in sanitation fees will not be needed. All recyclables will be taken to Montana Recycling, who will charge $0.50/bag for processing (at current rates). Hauling costs are not expected to be significant, as the Montana Recycling facility is in Helena, and the City already has a vehicle for this purpose. A revenue estimated at $0.14/bag will be accrued by the City. The volume of recyclables will not be known for some time since it is highly dependent on the success of the user education program. In the interim, participation is expected to only be a small percentage of the population. Therefore, the cost and revenue associated with the program cannot be estimated at this time.

When the County residents begin using the transfer station comes, it will dovetail with the existing City program. It will provide a drop-off location for County residents that do not have curbside pickup of recyclables (Hill 1993).

As with composting (described below), the greatest economic benefit from institution of a recycling program would likely be the decrease in landfill space corresponding to the amount of material recycled. The less volume of landfill needed per year for waste disposal the longer the lifetime of the facility. Environmental benefits of recycling aside, the economic savings realized by limiting landfill usage to only non-recyclable materials can be significant.

4.12.4.2 Composting Program

The cost of starting and operating a composting facility for a small community can be significant. This is especially true if it is the primary solid waste disposal method. According to research recently completed for the District, the cost of facilities in cities the size of Helena cost upward of $6 million (Meister 1992). The proposed composting program at the Lewis & Clark County facility, however, would be operated as a supplement to the landfill. The process could be kept simple, and could be limited to certain components of the waste stream (i.e. yard wastes, sewage sludge, etc.).

A County composting program at the landfill has several economic advantages including:

- The space needed would be located in the buffer zone around the landfill such that siting efforts and land acquisition would be unnecessary,
- Equipment already on-site could be used during construction,
- Use of District's landfill staff and equipment for composting,
- Increase in landfill life, and provide redundancy in the District's overall solid waste management plan. (Montana Integrated Waste Management Act of 1991.)

As described in section 2.5.3, it is expected that this system would be used for processing approximately 2,000 to 4,000 TPY of yard wastes. This volume would be generated sporadically (spring and fall), when yard clean-up projects are most popular. The composting system would require an engineering design to incorporate containment and management of leachate and odors, and ground water monitoring. New landfill wells may be needed to provide downgradient monitoring for the compost facility as well.

Construction requirements could include installation of a reinforced concrete pad and leachate collection system. A cover to limit infiltration of precipitation, and a leachate detention pond may also be necessary. (The landfill ponds for runoff control may be able to be used for this purpose, however.) Operations would include processing activities such as debagging and chipping or shredding, turning, and curing. Equipment needs include a shredder, windrow turner or front-end loader, and a screen for processing the cured material.

Bozeman, Montana has successfully implemented a low-tech composting system for its yard wastes (SWANA 1992). Bozeman's system processes about 1000 tons each year, and its year-round windrow is 200 to 300 feet long. The windrow is turned with a track loader. The waste is processed for approximately 20 months before being given away to residents. The City only charges for collection (which brings in about half of the total volume composted), earning a revenue of $14,500 per year. The Bozeman composting facility has remained a low-maintenance and economical process.

Typical costs for composting yard wastes range from about $15.00 to $100.00 per ton including collection, transfer, and processing (Biocycle 1989). Although it is most likely that the District would also make composted material free to its residents, revenues earned by programs around the country range from $4.00 to $10.00 per ton. Assuming that Lewis & Clark County composts 3,000 TPY, an annual cost of $45,000 to $300,000 could be incurred annually. However, the most significant economic impact could be the cost avoided by not landfilling the yard wastes. As the projected life of the landfill would be extended the capital cost and annual O&M costs (Table 4.12-1) would be reduced. Nationally, it has been found that the cost of composting is less than landfill tip fees (Biocycle 1989). Generally, the environmental impacts and associated liability would be reduced as well.

4.12.5 No Action

Sections 2.1.5.5 and 2.6 of this EIS, and the beginning of Chapter 4.0, discussed the possible ramifications of a No Action decision. Two possible scenarios were considered, including expansion of an existing facility in the study area, and export of solid waste to a licensed facility outside the study area. It was further determined to be very unlikely that either the Scratch Gravel or the Helena landfills could receive regulatory permission to expand, even if space were available, due to the existing problems with contamination and difficulties in meeting Subtitle D requirements. Therefore, no costs have been calculated to upgrade these facilities. However, estimates have been prepared for the cost to ratepayers to ship waste to a privately owned and operated facility near Great Falls, Montana based on the existing contract terms with the City of Helena. Other disposal option may be available in the region also. Other nearby potential landfills with sufficient capacity to accept the annual volume of waste from the County and City include BFI-Missoula, Butte-Silver Bow County, and Gallatin County.

As illustrated in Table 4.12-1, no capital cost would be incurred in the Helena vicinity under the export waste scenario. Costs to expand or upgrade the Great Falls facility would be borne by the facility owner, and transferred indirectly to the user through tipping fees.

The primary cost would be the tipping fee, charged per ton of waste disposed. The current tipping fee, shown on Table 4.12-1 as the annual O&M cost per ton of $15.95 is valid until July 1, 1994 under the City contract. After that date it will increase according to the Consumer Price Index and is also subject to increases due to increased regulatory costs or property taxes. It does not include other, less quantitative costs such as liability potentially incurred by the District under the Resource Conservation and Recovery Act, the Comprehensive Environmental Response, Compensation and Liability Act ("Superfund"), or the Comprehensive Environmental Cleanup and Responsibility Act (the Montana "Superfund" equivalent) for future environmental problems.

4.13 SHORT-TERM COSTS AND BENEFITS VS LONG-TERM PRODUCTIVITY

The Montana Environmental Policy Act requires that the proposed action be assessed for the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity. Short-term uses are considered for this analysis to be those that occur during the life of the landfill project. Long-term productivity refers to the ability of the land to produce a continuous supply of a resource. The following comments assess this relationship, based on the assumption that a landfill at any of the alternative locations would be constructed, operated, and ultimately closed, in compliance with environmental regulations.

- A maximum of 80 acres of land would be removed from agricultural use and habitat while the property is used as a landfill. Post-closure reclamation, including recontouring and revegetation, should restore wildlife habitat and allow the land to be returned to current uses (grazing or farming).

- The landfill would create a temporary visual alteration in the natural or existing landscape. This modification would exist for the life of the landfill. Post-closure reclamation should restore the visual characteristics of the property to near pre-landfill conditions.

- Landfill cell development and road construction would impact soil productivity through erosion and compaction. Reclamation efforts can restore and even enhance soil productivity over the long-term. Modifications in soil productivity could also impact or alter vegetative species, both in composition and productivity.

- A short-term degradation of air quality would occur during the life of the project due to construction activities, increased traffic, and other soil disturbance activities. Local air resource degradation could continue for some period after landfill closure if methane is generated and off-gassing vents are required.

- Noise levels would increase above existing conditions for the life of the project, due to construction and facility operations. This impact would cease upon facility closure and should result in no permanent or long-term change to the environment.

5.0

COMPARISON OF ALTERNATIVES AND DHES PREFERRED ALTERNATIVE

5.0
COMPARISON OF ALTERNATIVES AND DHES PREFERRED ALTERNATIVE

The alternatives evaluated in this EIS were developed in response to issues identified during the scoping process (refer to section 1.6 and Table 1.6-1). Alternatives selected for evaluation for environmental impacts have been subjected to an analysis of primary (or direct), secondary (or indirect), and cumulative impacts in chapter 4.0. This chapter provides a comparative analysis of the impacts on environmental resources resulting from implementation of each of the alternatives, including the Proposed and No Action alternatives. This chapter also discloses the alternative preferred by the Department of Health and Environmental Sciences and the rationale used in determining a preference.

Table 5.1-1 (at the end of this chapter) includes a summary of the potential environmental effects resulting from implementation of the five alternatives. As discussed previously in the EIS, evaluation of the No Action Alternative was primarily limited to socioeconomic considerations and impacts on quality of life. Alternative 4, Modification to the Proposed Action, would cause only limited effects beyond those described for the site alternatives.

While an attempt was made to highlight those factors that differentiated the alternatives and threatened the environment, it was not possible to address every issue or concern raised during the siting studies or the EIS scoping process. In some instances the relevancy of an issue, with respect to a comparison of the alternatives, was considered minimal and not evaluated. As an example, projections of waste and leachate generation were not completed as each (siting) alternative has a capacity of at least 30 years and some provision for liner and leachate control systems. Appendix A is a reference guide to the comments and concerns raised during project scoping, and where appropriate, the sections in the EIS discussing those issues of concern.

Although Chapter 4.0 included a comprehensive evaluation of impacts within the framework required of any EIS completed under authority of MEPA, other issues warrant further discussion and debate. For instance, a privately owned and operated landfill (the CCSS Landfill) just outside Lewis & Clark County is proposing to expand, with the intent of servicing portions of Lewis & Clark and Jefferson counties. A waste management plan coordinated between the two counties, using one of the facilities evaluated in this EIS or another site, could help limit both development and development costs, and concerns about future liability. Another issue concerns recycling. Helena and Lewis & Clark County have instituted recycling programs, but the success of their efforts may not be accurately measured for some time. This EIS considered an alternative employing waste reduction technologies (recycling and composting) without the benefit of data regarding the degree of citizen and business participation, thereby precluding an accurate projection of the reduction in waste disposal. The following sections provide some discussion on four more issues.

5.1 PERSPECTIVE ON SOLID WASTE MANAGEMENT

The residents, businesses, and industries of Lewis & Clark County produce wastes which must be managed. Solid waste management --- waste collection, storage, processing, transportation, and disposal --- takes a great deal of effort on the part of everyone. New environmental regulations designed to protect our quality of life are continually evolving and incorporating newly developing treatment and disposal technologies. Regulatory implementation and compliance requires a great deal of money. Part of the Helena and Lewis & Clark County management scheme will include land disposal in an existing, new, or out-of-county landfill. Each of these options will cause an increase in costs to the user over time.

The most important issue at hand is the development of an efficient and economical scheme that accommodates the Proponent's current and future needs and protects the environment to the maximum extent practicable. Although this EIS focused on several landfill location alternatives, the real issue is the adequacy of design, construction, operation, and closure of a landfill at any site. If these components are logical, comply with the federal and state regulations, and are not an unreasonable burden to the users, the Proponent and the licensing agency will have done its job.

5.2 EVALUATING IMPACTS ON NATURAL RESOURCES

The potential environmental impacts resulting from the development and operation of a landfill must also be put in proper perspective. There is a substantial difference between the unavoidable impacts caused by a state-of-the-art facility that is well-built, conscientiously operated, and closed in accordance with all regulations; and those impacts caused by a landfill that was built without the benefit of engineering designed to protect the environment. This difference is especially important when the impacts to surface water and ground water are considered. These resources can be maintained with little or no measurable impact if good engineering and sound operational practices are employed. Ground water quality, for instance, should not be impaired unless the liner system is compromised, or leachate or surface water control systems are mismanaged, or spills are not remediated. Subtitle D provisions and license requirements in Montana should help to ensure that new landfills are engineered properly and run responsibly. Other resources, such as air quality, soil productivity, wildlife habitat, may suffer an observable, but possibly not unreasonable, amount of degradation. Proper landfill design, construction, and particularly management, will be the key to a successful and environmentally protective waste disposal program.

5.3 SOCIOECONOMIC ANALYSIS

The numbers presented in Tables 4.12-1 and 4.12-2 may at first be startling. Projected costs are typically significantly higher than those originally prepared during siting studies and license application development. Unfortunately, the cost of developing, operating, and closing a state-of-the-art municipal solid waste landfill today is astronomical compared to costs of just a few years ago. These costs have escalated commiserate with our society's awareness of, and emphasis on, environmental protection.

The cost estimates described in Chapter 4.0 are not presented with a claim of strict accuracy, but because the estimates for each alternative site rely on the same or similar assumptions, the relative cost analyses should be valuable. Still, it is important to note that the cost estimates are not based on final design, and in the case of Site A and the CCSS Landfill, are not based on any site-specific design. Estimates for each site do assume compliance with state rules and Subtitle D requirements. State rules for solid waste disposal are more flexible for site-specific situations than federal regulations but no less stringent or protective than EPA's. Some of the more significant line items or factors that caused these estimates to vary from those previously developed include:

- Composite (soil/synthetic) liner system - The current Site E design includes a modified composite liner for the initial cells, Site A has no design, and the proposed CCSS Landfill expansion plans calls for 4 feet of clay (recently publicized, but not formalized, plans for the CCSS site describe a composite liner in conformance with Subtitle D)
- Leachate collection system, including pumping and storage
- Leachate monitoring and management, including disposal, through the operating life and during the post-closure period of thirty years
- Gas monitoring and management - Cost estimates provided in Chapter 4.0 assumed that a gas collection system, if needed, would not be required until installation of the final cover. However, new regulations may require gas management during operations
- Final cover construction estimates include composite barrier and erosion layers (current design for Site E and the CCSS Landfill call for soil covers only)
- Post-closure care, including maintenance and repair of wells, vents, cover and vegetation, runon/runoff controls, and monitoring of leachate, ground water, surface water, and gas
- Financial assurance, consisting of an annual sinking fund contribution, for both closure construction and post-closure care

5.4 WASTE DISPOSAL OUTSIDE OF THE STUDY AREA

Some evaluation has been provided of disposal of waste from the study area at the High Plains Landfill in Cascade County. At first glance, it appears that waste transport and disposal in an out-of-region facility would be simpler and at comparable expense . There are several important considerations.

First and foremost, although the local area (in this case, Helena and the Scratch Gravel Landfill District) may not be directly affected if waste is shipped outside the region, the residents and environment in the vicinity of the receiving facility will be impacted. Persons and governmental entities in Cascade County, or Missoula County, or some other area may not be receptive to waste imported from another community outside their region. In practical terms it is possible that further environmental analysis and upgrade would be required for the receiving facility.

As indicated in Chapter 4.0, the infrastructure and safety impacts caused by transportation out of the study area would be felt by local residents, regardless of the distant disposal option. More significant impacts could include the costs imposed by the host facility which must recover waste screening, disposal, insurance, closure, and post closure expenses, not to mention necessary upgrades or expansions to accommodate an extra 40,000 TPY of waste. While Table 4.12-1 includes haul costs to Great Falls, the tipping fee that this facility is currently charging will increase over time, even under the terms of the existing short term contract.

Additionally, the liability associated with waste disposal and environmental contamination remains with the waste generator (Helena and the Scratch Gravel Landfill District) as well as the waste disposal facility. In light of increasing environmental awareness on the part of government and citizens, the number of enforcement actions against municipal landfill owners and contributors have risen significantly. There are an increasing number of municipal landfill candidates for remedial response action under the federal Superfund law (CERCLA). Private facilities now have a great deal of economic and legal incentive to ensure proper landfill construction and operation. However, whether the landfill is privately owned and operated or run by a municipal entity, local oversight may be of primary importance. Use of a facility outside the region makes quality assurance of the facility even more difficult.

5.5 DHES PREFERRED ALTERNATIVE

The Department's rules adopted pursuant to the Montana Environmental Policy Act require the Department to state its preferred alternative, if any, in an Environmental Impact Statement. The five alternatives considered in this document in relation to the action of licensing a proposed landfill at Site E in Lewis & Clark County were considered the most reasonable choices for the purposes of comparison.

In review of the analysis of the four alternatives considered in this EIS, some basic problems have been identified which are outlined in the discussion of alternatives. As discussed in sections 2.1.2.2 and 2.1.2.3 any landfill site or facility used for the disposal of wastes from the proposed service area must comply with the minimum requirements of the state solid waste management rules which are in conformance with the mandatory federal rules known as Subtitle D (40 CFR Part 258) for location, design, monitoring, operation, and closure of the landfill. The new regulations became effective on October 9, 1993 for a large landfill such as the proposed Site E facility. Montana's Solid Waste Management Program received EPA program approval on December 21, 1993.

Alternative 2's (Site A) location as considered in this EIS places the northern portion of the site within 10,000 feet of a runway of the Helena Regional Airport. The existence of a landfill in proximity to an airport runway can increase the likelihood of bird/aircraft collisions that may cause damage to the aircraft or injury to its occupants. This potential landfill site would not be in compliance with the state (ARM 16.14.505(2)(c)(i) and the federal (40 CFR Part 258.10) regulations concerning airport safety unless a demonstration can be made that the possible municipal solid waste landfill is designed and operated so that the facility will not pose a bird hazard to aircraft. Notification of this facility's location to the Helena Regional Airport and the Federal Aviation Authority (FAA) would be required to provide an opportunity to review and comment on the site in accordance with FAA guidance. The FAA views this requirement and the required demonstration very strictly and in other situations has considered withholding federal funds from airports where this situation has occurred. The local FAA has indicated that they would oppose Site A as it is presently configured in its written comments to the Department. This may necessitate the abandonment of the northern portion of the site thereby limiting the projected life of the site or mandate considerable design modification to accommodate the conflict. This site also has the disadvantage of being located in a recharge area for the Helena Valley aquifer. This valley-fill aquifer system encompasses nearly eight square miles of the valley with the principle discharge point of Lake Helena. It is the sole source of domestic water supply for approximately 13,000 residents. Site A's location in the southern portion of the aquifer system make it upgradient from many domestic water supplies between Site A and Lake Helena. If a release of contaminants to the ground water were to occur it has the possibility of impacting numerous downgradient water supplies.

Alternative 3, (CCSS Landfill) in Jefferson County is located in the same general recharge area of the Helena Valley aquifer as Site A and could have the same impacts should a release of contaminants occur. Additionally, the viability of this option as a receiving landfill for Helena and Scratch Gravel Refuse District wastes has been impacted by the recently adopted emergency zoning which would prohibit this landfill from accepting the volume of wastes generated by these areas. In order for the CCSS landfill to accept additional wastes, the zoning would need to be lifted either voluntarily by Jefferson County or by successful litigation in the appropriate court of law.

Alternative 4, Modification of the Proposed Action (recycling and composting), might prove useful as a waste reduction method thereby reducing the amount of waste requiring disposal at the site on an annual basis and extending the life of the site. Lewis & Clark County and the City of Helena have already implemented a "Blue Bag Program" to provide curbside recycling opportunities for citizens. The Helena transfer station has increased recycling opportunities by offering additional drop off points for recyclables. In conjunction with the increased recycling at the transfer station, the City has also implemented a roving recycling drop-off trailer that is moved from area to area around town to provide increased opportunity to recycle for citizens. Composting of yard wastes and clean wood, on the other hand, has not been significantly established in the study area as a waste handling method although it is receiving increasing interest all the time. The operation of a major yard waste composting system at the proposed landfill would require increased control of surface water run-on and run-off for the composting areas as well as the incorporation of a composting pad in the facility design. In addition it would be necessary to implement operation and maintenance plan changes for the landfill. Possible impacts from both recycling and composting include increased capital costs for the development of the systems and necessary equipment, increased operational and maintenance costs for additional manpower, and possibly increased noise. Composting may also increase odor levels in the immediate area however, a properly operated and managed yard waste composting operation should not create any significant additional impact.

Alternative 5, the No Action alternative or denial of the license application for Site E, would actually necessitate some other action to dispose of the area's wastes. As mentioned in the EIS text, two options were considered; 1) continued use of existing landfills in Lewis & Clark County, and; 2) transport and disposal of waste to landfills in Missoula, Great Falls, or some other facility outside the Helena Valley. The first option has little viability due to the limited capacity of the existing landfills and the difficulty for either site to upgrade to Subtitle D requirements. Continued use of the present sites may also worsen existing environmental impacts occurring at each site. The second option would eliminate the need to locate a new municipal solid waste disposal facility in the Helena Valley, thereby reducing or eliminating potential physical and human environmental impacts which may be associated with waste disposal in the study area. The current contract between the City of Helena and Waste Management of Montana, Inc., for the transport and disposal of the City's waste indicates that the cost for this option is within the same range as the other options considered. However provisions in the contract for an annual increase based on the Consumer Price Index and adjustments to accommodate increased property and fuel taxes and increases that result from compliance with new laws and/or rules, have the potential to make this option more costly over time. Current projected costs for the proposed action compiled by Lewis and Clark County and their consultant, indicate that the County should be able to keep costs relatively stable for up to ten years.

In consideration of the above factors in conjunction with the overall analysis of all alternatives to the proposed action, the Department does not find any one alternative disposal site to be significantly superior to any other alternative site or the proposed action. Each one has potential advantages and disadvantages over the others. Additionally, the Department must consider national as well as state goals to reduce wastes requiring disposal by promoting reduction, reuse, and recycling. As a result, the Department's preferred alternative is Alternative 4, Modification of the Proposed Action to include reasonable efforts at reduction, reuse and recycling of wastes such as the current "Blue Bag Program" and expanded recycling efforts as well as composting, if feasible.

TABLE 5.1-1

SUMMARY OF IMPACTS BY ALTERNATIVE FOR THE LEWIS & CLARK COUNTY LANDFILL

Resource	Site E	Site A	CCSS Landfill	Modification to the Proposed Action	No Action
Soils and Geology	Temporary loss of soil productivity; some soil loss	Temporary loss of soil productivity; some soil loss	Temporary loss of soil productivity; some soil loss	Less soil required: composted soil amendment to enhance productivity generated on-site	Existing environment maintained
	Good supply of low permeability soils; but may require some amendment to meet Subtitle D standards	Supply of low permeability soils unknown; probably require amendment to meet Subtitle D standards or importation of suitable supply	Supply of low permeability soils unknown; probably require amendment to meet Subtitle D standards or importation of suitable supply		
	Within seismic impact zone	Within seismic impact zone	Within seismic impact zone		
Groundwater	Private wells and springs downgradient could be impacted by subsurface contamination	Assumed to be no residential wells immediately downgradient; verification required	Believed to be no residential wells immediately downgradient: verification required	Wastewater/leachate from composting operation would require management to prevent subsurface contamination	Existing environment maintained: if Scratchgravel and/or Helena Landfills continue to be used. high potential for increased contamination
			Lined expansion would limit existing negative impacts		
	Sufficient water supply	Groundwater supply assumed to be sufficient	Groundwater supply assumed to be sufficient		
Surface Water	Contaminated runoff would require management	Contaminated runoff would require management	Contaminated runoff potential	Wastewater/leachate from composting operation would require management to prevent surface water contamination	Existing environment maintained
	Runon control required	Runon potential high due to site location in drainage	Runon control required		
	Erosion potential	Erosion potential	Erosion potential		
Air Quality	PM_{10} and methane generation; odors from waste degradation	PM_{10} and methane generation; odors from waste degradation	PM_{10} and methane generation; odors from waste degradation	Composting may increase odor levels	Existing environment maintained
	Local degradation of air quality, primarily from road dust and soil disturbance activities	Local degradation of air quality, primarily from road dust and soil disturbance activities	Local degradation of air quality, primarily from road dust and soil disturbance activities		

TABLE 5.1-1
(Continued)

Resource	Site E	Site A	CCSS Landfill	Modification to the Proposed Action	No Action
Noise	Proposed noise may exceed EPA level for outdoor activities	Proposed noise may exceed EPA level for outdoor activities	Proposed and baseline noise exceed EPA level for outdoor activities	Composting would probably not increase noise levels above those associated with landfill activities; recycling assumed to take place at transfer station	Existing environment maintained
	Significant increase in noise levels to residents immediately near landfill				
Wildlife	Increased "nuisance animals"	Increased "nuisance animals"	Increased "nuisance animals"		Existing environment maintained; no loss of habitat or wildlife displacement
	Bald eagles could be attracted to food sources at landfill	Bald eagles could be attracted to food sources at landfill	Bald eagles could be attracted to food sources at landfill		
	Antelope displacement	Antelope displacement and loss of some winter range	Some additional loss of winter range		
Vegetation	Alteration of existing vegetation	Alteration of existing vegetation	Alteration of existing vegetation		Existing environment maintained
	Loss of vegetative cover until reclamation succeeds	Loss of vegetative cover until reclamation succeeds	Loss of vegetative cover until reclamation succeeds		
	Possible weed infestation	Possible weed infestation	Possible weed infestation		
Cultural Resources	Historic building and trail may be displaced, lost, or otherwise impacted	No survey conducted for cultural resources	Cultural resource content on-site is unknown		Existing environment maintained
			Kleffner Ranch could be impacted by expansion		
Roads and Transportation	Increased traffic flow	Increased traffic flow	Increased traffic flow	Reduction in waste haulage due to recycling efforts at transfer station	Dramatically increased haul distances if waste shipped to facility out of study area (i.e., Missoula or Great Falls)
	1 congested intersection	2 to 8 congested intersections (depending on haul route used)	2 to 8 congested intersections (depending on haul route used)		
	2 high-accident locations	3 to 14 high-accident locations (depending on haul route used)	4 to 15 high-accident locations (depending on haul route used)		
	New access road	New access road	Access road improvement		

TABLE 5.1-1
(Continued)

Resource	Site E	Site A	CCSS Landfill	Modification to the Proposed Action	No Action
Land Use and Recreation	Temporarily remove land from agricultural use	Temporarily remove land from agricultural use	Land already in use as landfill		Existing land uses maintained
	Potential deterrent to residential development	Potential deterrent to residential development	Potential deterrent to residential development		
	Some land removed from hunting	Some land removed from hunting	Emergency zoning may not allow landfill expansion		
		Potential recreational impacts to bikers and pedestrians			
Visual	Facility clearly visible to nearby residents, motorists	Visual impact not as widespread	Expansion to west would cause visual impacts to residents south, west of facility, motorists		
	Changes to existing landforms	Changes to existing landforms	Changes to existing landforms		
	Blowing litter	Blowing litter	Blowing litter		

TABLE 5.1-1
(Continued)

Resource	Site E	Site A	CCSS Landfill	Modification to the Proposed Action	No Action
Socioeconomics[1]					
- Acreage	80 acres	80 acres	60 acres	n/a	n/a
- Projected Life	50 years	50 years	38 years	n/a	7 years[4]
- Capital Cost	$9.1 - $16.7 million	$9.1 - $17.1 million	$0.00[2]	n/a	$0.00
- Capital Cost (per ton)	$4.57 - $8.36	$4.57 - $8.53	$0.00[2]	n/a	$0.00
- Annual O&M	$508,000 - $858,000	$508,000 - $858,000	$1.5 million[2]	n/a	$638,000[4]
- Annual O&M (per ton)	$17.27 - $29.81	$17.27 - $29.98	$36.70[2]	n/a	$15.95[4]
- Total Estimated Disposal Cost per Ton	$17.27 - $29.81	$17.27 - $29.98	$36.70[3]	n/a	$15.95[4]
- Annual Estimated Transportation Cost	$87,700	$62,300	$72,100	n/a	$446,000[4]
- Annual Estimated Transportation Cost per Ton	$2.19	$1.56	$1.80	n/a	$11.15[4]
- Total Estimated Disposal & Transport Cost per Ton	$19.96 - $32.00	$18.83 - $31.54	$38.50[3]	n/a	$27.10[4]

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[1] See Tables 4.12-1 and 4.12-2 in Chapter 4.0 for explanation of cost derivations.

[2] CCSS Landfill is a private facility; capital costs would not be paid directly by users, O&M costs based on tipping fee.

[3] Based on estimate contained in CCSS proposal to City of Helena in September, 1992 (Sale 1992). However, this estimate is based on a short-term contract of 2 years: it is likely costs could be lower for a longer-term commitment.

[4] Based on City of Helena contract to utilized High Plains Landfill near Great Falls (Waste Management 1993). However, this estimate is based on a short-term contract of 2 years: it is likely costs could be lower for a longer-term commitment.

6.0
PUBLIC AND AGENCY INVOLVEMENT

CHAPTER 6.0
PUBLIC AND AGENCY INVOLVEMENT

The Scratch Gravel Landfill District Board submitted an application for a license to operate a sanitary landfill to the Montana DHES in March, 1990. The application, to use a 320-acre parcel northeast of the city of Helena, was amended and revised several times during the next 1½ years in response to DHES notices regarding incomplete or deficient application information. DHES initiated an EA in mid-1991. The purpose of the EA was to evaluate potential environmental impacts resulting from the siting and operation of a landfill at Site E. The EA, completed in September 1991, concluded that significant environmental impacts resulting from the Proposed Action were not likely. However, numerous written and oral public comments in opposition to the landfill were received by DHES after release of the EA. DHES notified the Lewis & Clark County Commissioners in November 1992 that an EIS would be necessary to fully explore the potential impacts of the proposed landfill at Site E.

This chapter describes the scoping process which initiated the EIS. It also provides information regarding review of the Draft EIS, public comments received on the Draft EIS, DHES's responses to those comments, distribution of the Final EIS, repository locations, and where additional copies of the Final EIS may be obtained.

6.1 PUBLIC AND AGENCY SCOPING

There has been a high level of public interest and concern about the Scratchgravel District's landfill siting process since the siting studies were published. Lewis & Clark County held public meetings to explain the need for a new landfill in the area, and the process used in screening alternatives sites and making a final site selection. DHES and their consultant reviewed citizen comments during the public scoping process initiating this EIS. A summary of concerns raised in writing or during public forums to discuss the landfill siting project is found in Table 1.5-1 of this EIS.

DHES held a public scoping meeting for the Landfill EIS on June 11, 1992. The purpose of the meeting, which took place in the Cogswell Building of the Capital complex in Helena, was to solicit interest, issues, and concerns about Site E and the process of developing an EIS for the landfill. Prior announcement of the meeting was made in the *Independent Record*, on local access cable TV and local radio, and in a letter sent to all parties on the DHES' mailing list for this project.

Approximately 50 people attended the scoping meeting, which lasted about two hours. DHES, their EIS consultant, and the County's landfill siting consultant made presentations on the history and background of the project, development of the siting studies, and the EIS process and schedule. Three citizens presented prepared comments, after which the meeting was opened up to questions and answers, and general comments. Comments expressed during the meeting were generally similar to those expressed in writing or at public forums during the previous few years. Written public comments were collected during a 30-day comment period following the scoping meeting. A transcript of the scoping meeting is available for review at the DHES offices on Front Street in Helena.

Comments and concerns raised during the scoping period have been summarized and categorized by environmental resource. These comments, and a cross-reference indicating where information relevant to the comment may be found in the EIS, are located in Appendix A of this document. Not all comments have been addressed in this document, for various reasons. Comments specific to a landfill site not evaluated in this EIS do not have a response. This is the case for most comments regarding sites B, C, D, F, G and H (letters refer to the designation given sites in the Phase 1 Siting Study). Other comments or questions may not have a response because the information necessary to satisfactorily address the issue is not available. Some comments are merely statements of preference, and require no response.

A scoping meeting for agencies with interest in the EIS and proposed landfill activities, and/or jurisdiction over activities or resources associated with the project, was held on June 22, 1992. Representatives from the DHES Water Quality Bureau, Lewis & Clark County, city of Helena, Citizens for a Responsible Landfill, Montana Environmental Information Center, and Woodward-Clyde Consultants attended the meeting. Other parties invited included the DHES Air Quality Bureau, U.S. Fish & Wildlife Service, Department of Fish, Wildlife and Parks, U.S. Environmental Protection Agency, U.S. Geological Survey, Bureau of Reclamation, Soil Conservation Service, State Historic Preservation Office, and Montana Bureau of Mines and Geology.

6.2 EIS REPOSITORY

A copy of the Final EIS may be reviewed at the following Helena locations during normal business hours:

- DHES, Solid & Hazardous Waste Bureau, 836 Front Street
- City-County Health Department, Suite 207, Medical Plaza, 1930 9th Avenue
- Lewis & Clark Library, 120 S. Last Chance Gulch
- City-County Health Department, City-County Building, Room 409, 316 N. Park Avenue

6.3 ADDITIONAL INFORMATION

Additional copies of the Draft EIS may be obtained by contacting one of the following persons:

Mr. Jon Dilliard
Manager, Solid Waste Program
MDHES, 836 Front Street
Helena, MT 59620
(406) 444-1430

Mr. James Wilbur
Licensing Coordinator
MDHES, 836 Front Street
Helena, MT 59620
(406) 444-1430

6.4 EIS DISTRIBUTION

Copies of the Draft EIS have been provided to approximately 185 recipients who have indicated an interest in the Lewis & Clark County Landfill project. These include government agencies and officials, businesses, individuals, and organizations. The mailing list is included in Table 6.4-1.

Copies of the Final EIS will be provided to approximately 200 recipients who have indicated an interest in the Lewis & Clark County Landfill project. These include government agencies and officials, businesses, individuals, and organizations. The mailing list is included in Table 6.4-2.

6.5 PUBLIC COMMENT ON DRAFT EIS

The Draft EIS was published and distributed on April 22, 1993. A thirty (30) day public comment period (until May 24th) on the document commenced on that day for the submittal of written comments. This comment period was later extended until June 4, 1993 by DHES due to a request for additional time for review. A public hearing for testimony on the Draft EIS was held in the Cogswell Building of the Capital complex in Helena, on May 17, 1993 at 7:00 pm. Approximately 50 people attended this hearing with 17 persons giving verbal testimony; four written statements were received. During the public comment period twenty (20) written comments were received by DHES. One comment from Mr. Arbini was faxed to the DHES office apparently within the specified time period, but was not received by DHES at that time. At copy was received later with verification of transmission and was included in the comments to the Draft EIS as requested. The following section (6.5.1) contains copies of all written comments received and a transcript of the statements made at the public hearing held May 17th, 1993. Each individual comment is coded with a letter corresponding to one author or "T" for statement contained in the hearing transcript and a number to delineate the individual comment. An example would be one sentence or paragraph dealing with an issue would be labeled B-3, if this was the second letter and 3rd comment contained within the letter. The coding was done so that the DHES response to individual comments, which are printed in section 6.5.2, can properly be match to correct comment in the previous section.

TABLE 6.4-1

DRAFT EIS DISTRIBUTION LIST

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East Helena, MT 59635

Pam Boggs
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Betty Brand
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Helena, MT 59601

Joe Brand
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Helena, MT 59601

Steve Browning
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Dorothy Carpenter
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Greg Chadwick
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Helena, MT 59601

Karen Chadwick
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Mr. & Mrs. William Chambers
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Helena, MT 56901

Jeff Claassen
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Don Coburn
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Ron Crawford
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Margaret Crennen
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Carol Crider
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TABLE 6.4-1 (Cont'd)

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Helen Dawson
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Kent A. Dodge
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TABLE 6.4-1 (Cont'd)

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M. A. Lovely
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TABLE 6.4-1 (Cont'd)

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Colleen McCarthy
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TABLE 6.4-1 (Cont'd)

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Montana 59633

George Ochenski
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Cindy Pidd
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Clancy, MT 59634

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Josephine Redding
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TABLE 6.4-1 (Cont'd)

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Helena, MT 59601

Emil Tenneson
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Sky Tenneson
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Bill Uthman
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Don Vidrine
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TABLE 6.4-1 (Cont'd)

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TABLE 6.4-1 (Cont'd)

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DHES, Water Quality Bureau
Cogswell Building
Capitol Station
Helena, MT 59620

Dept of Fish, Wildlife, and Parks
Capitol Station
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Department of State Lands
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State Historical Preservation Office

TABLE 6.4-2

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TABLE 6.4-2 (Cont'd)

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TABLE 6.4-2 (Cont'd)

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TABLE 6.4-2 (Cont'd)

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TABLE 6.4-2 (Cont'd)

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Ron Miller
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TABLE 6.4-2 (Cont'd)

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Karolyne Redding
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TABLE 6.4-2 (Cont'd)

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Jack Sedgwick
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Tony Simonich
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TABLE 6.4-2 (Cont'd)

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TABLE 6.4-2 (Cont'd)

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Tom Huddleston
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Colleen McCarthy
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Paul Sihler
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Mike Murray
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TABLE 6.4-2 (Cont'd)

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Blake Wordal
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Bill Verwolf, City Manager
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Eric Griffin
County Dept., Buildings
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Ted Hill, Env. Eng.
City of Helena
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Scratch Gravel Refuse Dist. Bd.
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Dan Martin
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DHES, Environmental Sciences
Tom Ellerhoff
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Capitol Station
Helena, MT 59620

DHES, Water Quality Bureau
Cogswell Building
Capitol Station
Helena, MT 59620

Office of the Governor
State of Montana
State Capitol
Helena, MT 59620

Dept of Fish, Wildlife, and Parks
Capitol Station
Helena, MT 59620
Department of State Lands
Reclamation Bureau
Capitol Station
Helena, MT 59620

U.S. Environmental Protection Agency
Federal Bldg, 301 S. Park
Helena, MT 59626-0096

TABLE 6.4-2 (Cont'd)

U.S. Fish & Wildlife Service
Federal Bldg, 301 S. Park
Helena, MT 59626

Lewis & Clark County
City-County Health Dept.
316 N. Park
Helena, MT 59601

Federal Aviation Administration
Helena Airport, Airport Road
Helena, MT 59601

State Historical Preservation Office
225 North Roberts
P.O. Box 201201
Helena, MT 59620-1201

6.5.1 Publc Comments on Draft EIS & Transcript of Public Hearing

4930 Highway 12 West
Helena, MT 59601
May 20, 1993

D.H.E.S. Solid and Hazardous Waste Bureau
836 Front St.
Helena, MT 59601

To Whom It May Concern:

I live at 4930 Highway 12 West, Helena. I own a cabin in the TOK subdivision on Hauser Lake. I also own property north of the present city landfill. I have been a concerned county tax payer watching the site selection for the proposed landfill from the beginning and would like to make a few comments.

(1) It appears to me that the government officials have been as objective, as possible, in the site selection.

(2) Even though I do not like owning property next to the landfill, I will say that the city has been a good neighbor and has responded to problems as they arose.

(3) I am concerned about the impact on my property at Hauser Lake, but feel that the impact would be small and because of the geological formation at Site E, it is the best site. I, therefore, am willing to put up with the impact.

A-1

(4) I believe the public comment toward our city and county officials has been grossly unfair. There have been some half-truths and outright lies made toward these people. I, on some occasions, have been critical of our city and county government, but this is one time I think they should be commended for their effort on a very difficult matter.

It is unfortunate that these selfish protesters, have caused additional expense that taxpayers are having to pay, which will amount to several hundred thousand dollars.

Sincerely,

Frank Gruber

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MAY 21 1993
MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID AND HAZARDOUS WASTE BUREAU

May 20, 1993

Mr. Jim Wilbur
Montana Department of Health and Environmental Sciences
Cogswell Building
Capital Complex
Helena, MT 59601

MAY 24 199
MONTANA DE
AND

Mr. Jim Wilbur:

This is a follow-up letter concerning my comments made at the public hearing concerning the draft environmental impact statement for Site E. I do not know if you truely understand the questions I was raising. When dealing with groundwater there are two distinct aspect to any ground water study. There is quantity and quality.

The study of groundwater quantity entails primarily the measurement of water levels and aquifer testing to determine the transmisivity. When Mr. Pat Dunlavy was asked to comment on the frequency of sampling, he refered to the fact that water levels were collected in January 1990 as well as September 1990. First of all, sampling is a reference to water sample collection, NOT water level measurements. B-1 Secondly, I would really question the expertise of a consultant who would try to convince me that water levels measured in September would be significantly different from those collected in January. These two water level measurement episodes are basicly measuring the lowest water levels twice. They are not measuring the anticipated maximum and minimum of the year, which was the point that he was eluding to. B-2

As far as water quality sampling is concerned, the EIS stated that baseline water samples were to be collected prior to the acceptance of any material at the landfill. These samples were to be collected during the anticipated minimum and maximum water level periods. They were to be collected from:

- 3 domestic wells
- 3 monitoring wells on the site
- 3 monitoring wells off the site

If my math serves me correctly, that means 18 samples must be collected as part of the baseline analysis of this study. Nine samples in the spring and 9 in the fall. These samples must be analyzed for all the constituents that are required for analysis during the regular monitoring program listed on page 2-30. This is essential since this will be the only opportunity to collected baseline data, IF the license is approved.

My main concern here is the requirement to analyze for the 46 volitile organic compounds and the complete line of trace metals. This is concern for me because this site is located in an agricultural area and no doubt herbicides and pesticides have been used in the area. If the aquifer has trace amounts of these organic compounds prior to the acceptance of waste, then the landfill operators would have documentation to that end quantifying the extent of the contamination. B-3

Concerning the trace metal analysis, the extent of natural occuring trace metals must be documented. This is essential, so aquifer damage resulting from the landfill can be quantified. B-4

As you know the collection of samples for analysis of these compounds is highly technical. Ultraclean field laboratories and the "clean-hands/dirty-hands" field procedures are manditory. Requirement of Quality Assurance blank samples and field equipment blank samples should be required protocol to assure that any trace metal contamination is a result of water contamination and not merely the result of dirty sampling equipment. I'm sure your protocol required to your consultants meets the standard parts-per-billion (ppb) sampling requirements for trace metal analysis, as required by EPA. B-5

I hope this letter helps make it clear what my concerns are for information that was required, but lacking, from this EIS. A baseline understanding of the groundwater resource is essential quantifiable documentation that is minimally needed by landfill operators for their own protection from future litigation concerning groundwater contamination. It is needed by local landowners so they can be assured of pre and post conditions of the only water resource available to them. Your help in assuring that these required analysis be accomplished in a manner of good science would be greatly appreciated. If you have any questions concerning the contents of this letter, do not hesitate to call me. B-6

Sincerely,

Kent A. Dodge h: 227-8072
5700 York Road w: 449-5263
Helena, MT 59601

May 20, 1993

Landfill

Continued from Page 6A

dents who would have no control over the prices.

"I don't want to leave the citizens in a bind of having a sole source service provider for something as fundamental as garbage disposal," she said. "We did look at private proposals, but none surfaced that were any more economical than what we're going with."

Miller also wants Site A — which lies one mile southeast of East Helena's Asarco plant — used instead of Site E — 10 miles northeast of Helena — because his adjacent land at Site E has more development potential than Site A. Because of that, he's offered to lower the land price for Site A by $50,000, swap Site E for Site A, and make the city and county pay only the difference between the two pieces of property. However, based on previously quoted purchase prices, that difference could be about $150,000.

City Manager Bill Verwolf said that's a good deal — for Miller.

"He wants two times as much money for half as much land as the county got at Site E.," Verwolf said Tuesday. "So if he lowered the price (for Site A), gave us $200,000 for Site E we still would have to pay him $150,000, which is more than that piece of land is worth."

The city paid $127,000 for Site E.

Complaints about water testing at the site also surfaced at Monday's meeting. Wayne Miller, who owns property adjacent to Site E, said test wells were drilled only on the periphery of the site.

Wilbur said initially only three wells were drilled, but six more were done by 1990, and maps in the EIS show eight monitoring wells and three borings.

"We feel that the information provided by the additional drilling and geotechnical information out there does give us a good representation of the hydrogeology of the area," he said. "We have sufficient wells out there now to have an acceptable groundwater monitoring program."

Good, but what about a baseline analysis of the resource.

Another complaint about the water tests is that they were conducted in September 1990, which not only was a drought year but also was done in the fall, a time when there's less water than during spring runoff.

But Pat Dunlavy of Chen-Northern, which did most of the water sampling for the EIS, said wells also were tested in January 1990. Water levels were within one foot of each other on the two days the testing was done, which is typical for that type of soil, he said, adding that water levels at Site E don't fluctuate like they do in the valley aquifers.

Sampling wells has nothing to do with measuring water levels in wells. They are two distinct operations

May 21, 1993

Montana Dept of Health & Environmental Sciences
Solid & Hazardous Waste Bureau
Attn: John Dillard
Cogswell Bldg
Helena, MT 59601

Dear John,

As a member of the Helena silent majority, I have decided that the time has come for me to voice my opinion on the controversy surrounding the Site E. Garbage dump situation.

My family has lived within ½ mile of the current city of Helena dump for 13 years. We have enjoyed our home, lived healthy lives, and have never had a single problem because of the dump. The property value of our home continues to go up despite our close location to the dump. Children from our neighborhood play soccer and other sports on what was once a dump. C-1

I implore the Department of Health & Environmental Sciences to get on with the job at hand and approve the Site E Landfill.

Yours respectfully,

Pat Franks

Pat Franks
4 Oak Circle
Helena, MT 59601

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MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES

To the Commissioners of Helena/ Lewis and Clark County:

This is to certify that I am willing to trade the parcel of land known as Site A, consisting of 160 acres of land (the exact point of take to be determined by the appropriate agency, since Site A has been described variously as consisting of 80, 160, and 200 acres), for the parcel of land known as Site E, which consists of 320 acres of land. My only remuneration would be some small compensation for the disturbance of soil on Site E. D-1

My opposition to Site E is as follows:

1. Much farther from town than Site A. Fuel costs will increase significantly over the next fifty years. These increases were never figured into the cost of maintaining Site E. D-2

2. Trucks hauling garbage would have to use local county roads, particularly York Road, which was not constructed to handle heavy truck traffic. Site A can be reached almost entirely on Federal highway, built to handle heavy trucks and maintained by the Federal government. D-3

3. Site E is very difficult to reach during winter, because of the steep incline coming onto Deal Lane. Suggestions to truck the garbage around the back way through Lakeside would increase fuel costs significantly. D-4

4. Site E is a very visible site, since it sits atop a plateau in the Helena Valley. Once operational it would be noticeable by anyone driving by on Deal Lane on the way to Lakeside. In contrast, Site A is very isolated, being shielded by low hills on three sides. People driving by would not know it was there. D-5

5. Site E sits atop a hill in close proximity to three major bodies of water; Lakeside, Lake Helena, and the regulating reservoir. Since all water seeks the lowest level, liquid effluent will eventually leach into the surrounding water tables. However, Site A is nestled in a dry gulch, far away from any bodies of water or wells. D-6

6. Site E is a very poor choice for socio-economic reasons, as verified by every study ever made of this area, including the recent assessment by the EIS. My own analyses have confirmed this: Site E has the greatest potential for population growth of the first five areas studied. In contrast, Site A is so isolated that population growth is not expected there for another 50-100 years. D-7

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AND ENVIRONMENTAL SCIENCES
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7. Water samples taken from Site E have yielded ambiguous results, because of the complexity of the hydro-geologic structure of the area. However, Site A is very stable, with at least 85 feet of mostly lava rock to water. D-8

At the site selection meeting in August, 1989, we were told
that Site E was cheaper than Site A, and had a longer life. D-9
However, increases in fuel and other costs incident to Site
E were minimized or ignored. Also, even though I had offered
to take less money for Site A even before the decision was D-10
made, I was never approached with a counteroffer. As for
Site E's longer life, the amount of site E suitable for
landfill was downsized as soon as the first tests for water
were made on this site. (These tests were not performed
until after Site E was selected!). Consequently, the amount D-11
of land suitable for a landfill on Site A and Site E are
now about the same.

Another option is the possibility of hauling garbage to Site A by train. Right now garbage is trucked to the landfill next to the YMCA. There is a railroad track right next to that site. Why not put a railroad spur near that site and load several railroad cars with garbage (they each hold the equivalent of 3-5 garbage trucks). Then once a week or so have RailLink or BN haul the garbage from the site. At Site A, you would need to construct 3500-4000 feet of rail through agricultural land (much of it mine) to connect to the main track. The garbage could thus be hauled by train, in covered freight cars. No one would even know that garbage was being transported! Fuel costs would be a fraction of hauling by truck. The freight cars could be leased from RailLink or BN, and no new garbage trucks would be needed. D-12

Each of you campaigned with the promise of fiscal responsibility. Site E is definitely not the best site socio-economically, as evidenced by every study produced thus far. With this significant reduction in the cost of purchasing Site A, Site E will be much more costly to operate over the long term, and will negatively impact far more people. D-13

I offer this option not just as an affected landowner, but as a concerned citizen who loves Helena and the Helena Valley. Please give this proposal your most careful consideration.

I await your response.

Sincerely,

Wayne Miller

Wayne Miller
P.O. Box 4087
Helena, MT. 59604
May 27,1993

cc: Dept. of H and ES
Solid + Haz. Wastes Div.

June 1, 1993

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JUN 02 1993

MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID AND HAZARDOUS WASTE BUREAU

John Dilliard
Solid and Hazardous Waste Bureau
836 Front Street
Helena MT 59601

RE: Site E Landfill EIS

Dar Mr. Dilliard:

The undersigned residents of the East Helena area wish to let you know that we agree with the proposed decision of the Department of Health to license Site E as a landfill.

As with the the case of the Hospice Six nurses before the Montana State Board of Nursing, it is time to bring this matter to a close. It has been hashed and rehashed, discussed, studied and researched long enough. At some point in time a decision must be made and we believe the decision to license Site E is as good as any.

We believe the EIS was thorough and comprehensive and we doubt any other proposed site would fare any better under such scrutiny. We understand no other landfill site in the entire state of Montana has ever experienced such detailed and extensive review. We strongly urge you to adopt the proposed decision to license Site E.

E-1

Thank you for the opportunity to comment on this very important decision.

Lisa F. Casman, 3681 Rodeo Rd, Helena MT 59601
Brenda St. Clair, 120 East [illegible], East Helena
Jerry L. Knerr 612½ Porter, East Helena 59635
Bruce A. Dueckler, Box 60, East Helena, MT 59635
Teresa Austine Box 212 East Helena MT. 59635
Carrie Vlk 103 Muskrat Trail, E Helena, MT. 59635
Stephanie Chambers 110 Muskrat Trail E. Helena MT 59635
Jimmy Chambers 110 Muskrat Trail E. Helena MT 59635
Shawna K. Wing 103 Muskrat Trail E. Helena MT 59635
Tony M. Wing 103 Muskrat Trail E. Helena MT 59635
302 Beaverslide Dr E. Helena MT 59635

Cathy Beck-Jerkins	208 Buffalo Run Rd	237-6025
[illegible]	202 Buffalo Run	237-5095

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JUN 03 1993
MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID AND HAZARDOUS WASTE BUREAU

To:
Department of Health and Environmental Sciences
Solid Waste Program

From:
The Greenfield family
3925 Deal Lane
Helena, Mt 59601

To Whom It May Concern:

The following is public comment pertaining to the permitting of Site E for a landfill:

No new information has been added since the EA was issued. No new wells have been drilled to determine the potential for ground water contamination and some of the original information still hasn't received the attention it needs. F-1

EXAMPLE:

The stream that runs east of the site is 'assumed' to be fed by irrigation. Interesting indeed! As there is no irrigation ditches above it nor is there any irrigation done during the months of December or January (when the stream still flows) I draw but one conclusion from this ... somebody has guessed and guessed badly. Of course the possible source of the water is from springs and the potential for contamination is there. F-2

Another EXAMPLE:

Why are the 'sand and gravel' areas still being ignored? These areas have had the fines removed from them ... by what source? The wind? Hardly! At some time there has been water flowing through them which removed the fines and left the sand and gravel bars. However the Permeability tests done on the various 'water bearing' zones has ignored them.

E-2 was tested at 85' to 90' ... however there is sand and gravel at 45' to 53'.
E-6 was tested at 154' to 164' ... however there is sand and gravel at 21' to 40'.
E-7 was tested at 150' to 160' ... however there is sand and gravel at 35' to 39'.
E-8 was tested at 128' to 134' ... and the sand and gravel is found at two areas above that, 36' to 41' and 83' to 87'.
E-9 was tested at 143' to 157' ... and there is sand and gravel at 18' to 25'.

Why was there no permeability tests done at these levels? Or was there? F-3

There are still only two test drillings within the confines of the proposed eighty acre site itself ... is this really enough to determine everything you need to know about the site? F-4

These examples show what I feel is lacking in the EIS as far as being able to make an environmentally sound choice.

Of course we have other reasons to not want the landfill too. Number one is the fact that my house is just sixty feet away from the fence line and that being in the northwest 'recharge' area. Recharge? With the flow going in various directions (west included), I consider this to be a threat to the health of our family ... until it does affect it! F-5

Being this close to a potential landfill with our house has certainly restricted our ability to sell the house at the appraised value when it was built. The realtors don't really want to list it nor do the appraisers want to appraise it. Seems they would really prefer not to get into potential future litigation. I've been told by two appraisers that the best they would appraise it at would be as salvage only. F-6

Further, the permitting and subsequent use of site E would be a definite change of lifestyle for our family. The rodent problem ... the scavenger birds ... the noise ... the dust ... the additional traffic ... would all have a definite impact on our current lifestyle. With the possibility of a compost operation taking place as well ... the stench would get even worse than it would already be.

We didn't build out here with even the remotest thought to a potential landfill ... if there had even been a hint ... we would never have built here. F-7

All in all ... I don't feel the EIS is anywhere near complete in addressing the various issues. However, if the site is permitted I will be forced to utilize Constitutional Law (circles and accountability) and sue everybody individually and collectively that has had anything to do with the choice of site E and its permitting.

We should be considered as part of the problem here and bought out completely. However, as we have an additional 320 acres as well as two houses ... the county doesn't want us considered as part of the problem. F-8

Also ... I work for the city of Helena Water Department ... but that won't stop me from litigation. I can't personally afford to loose $200,000 nor can my family afford to loose $400,000.

Bill Greenfield

MONA JAMISON
ATTORNEY AT LAW

POWER BLOCK BUILDING, SUITE 4G
POST OFFICE BOX 1698
HELENA, MONTANA 59624

PHONE: (406) 442-5581
FAX: (406) 449-3668

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JUN 0 3 1993
MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID AND HAZARDOUS WASTE BUREAU

To: Mr. Bob Robinson, Director, Department of Health and Environmental Sciences
Mr. Jon Dilliard, Program Manager, Solid and Hazardous Waste Bureau, Department of Health and Environmental Sciences

From: Mona Jamison, Attorney for Citizens for a Responsible Landfill

RE: Comments on "Lewis & Clark County Landfill-Draft Environmental Impact Statement" (April 1993)

Date: June 4, 1993

INTRODUCTION

On behalf of Citizens for a Responsible Landfill ("CFRL"), I am submitting comments on the Draft Environmental Impact Statement ("DEIS") prepared by the Department of Health and Environmental Sciences ("DHES") for the proposed Lewis and Clark County Landfill at Site "E".

I. SCOPE OF DEIS IS INADEQUATE

When the Operation Plan and License Application for a Class II sanitary landfill at site E was submitted to DHES in March, 1990, it was submitted for a 320 acre site, 189 of which would eventually be used for solid waste disposal. The application is clear on its face as to the size of the landfill. Page 1 of the application states as follows: "The actual area to be landfilled is approximately 189 acres." (Page 1 of the application is marked Attachment 1, and by this reference, incorporated herein.) Even the license application form contained in the application indicates as follows: G-1

> "Total acreage of proposed site: 320 acres
> Acreage usable for the solid waste system: 189 acres"

(The application form is marked Attachment 2, and by this reference, incorporated herein.) Surprisingly, the DEIS only evaluates the environmental impacts of 80 acres (Phase I) and not the full 320 acres applied for.[1] While the DEIS states that the proposed action is for 320 acres having a 91-year life (see p.3 of Attachment 2 and p.2-18 of DEIS), the DEIS analysis is totally deficient regarding the remaining 109 acres. Even Table 2.1-3 in the DEIS (see p.2-12 of DEIS) entitled "Summary of Site Data-Phase II Siting Study," describes Site E as having 189 "usable acreage." G-1

This deficiency, on its face, renders the DEIS inadequate and out of compliance with MEPA. The fact that the Scratch Gravel Landfill District Manager on March 17, 1993, conveniently informed Mr. Dilliard of the Solid and Hazardous Waste Bureau that the County's application "is to apply to Phase I of the project only," cannot remedy this substantial MEPA defect. (A copy of this letter is marked Attachment 3, and by this reference, incorporated herein.) It is certainly curious that approximately three years after the application is submitted to DHES, and just a short three weeks prior to distribution of the DEIS, such a declaration would be made. G-2

MEPA and DHES' MEPA rules require that an EIS be prepared on "proposals for projects". The County's proposal is for a Class II sanitary landfill at a 320-acre site, 189 acres of which will be used for landfilling. The March 17, 1993 letter cannot be relied upon three years after application submittal to "redesign the application" or to remedy a major and glaring defect of the DEIS on Site E. G-3

The DEIS must be prepared on the application as submitted. Failure to do the DEIS on the applied for 320 acre/189 landfilling acre site renders the DEIS inadequate while totally distorting and minimizing the environmental and cost impacts associated with the development of Site E. Significantly, those impacts are distorted and minimized as they are evaluated against the alternatives. G-4

The DEIS states in many places that only a preliminary design for Site E has been submitted to DHES by the County. The EIS must evaluate the final design, as mentioned above, for compliance with Subtitle D and other applicable rules. Further, has the final design of Site E been awarded? To whom? For how much of a fee, and has that fee been included in the costs associated with the development of Site E? G-5

Every aspect of the analysis for Site E, including those aspects enumerated in Chapter 3.0, entitled Affected Environment, G-6 must be redone to reflect the impacts of Subtitle D, or analyzed in the Supplement. Needless to say, the section on socioeconomics and cost must be redone to reflect the impacts of Subtitle D on the entirety of SITE E. Table 4.12-1, Table 4.12-2, and Table 5.1-1, must be revised to reflect the analysis. Obviously, the one major benefit of analyzing only Phase I of the site E, is to obscure and artificially deflate the real costs associated with Site E. G-6

---

[1] The DEIS expressly admits it limited scope of coverage. On page S-2 it states: "Only Phase I of the proposed landfill, which includes 80 acres of the total 189 acres planned for use as a landfill, was evaluated." (emphasis added)

II. REQUEST FOR SUPPLEMENT TO DEIS

When Lewis and Clark County ("the County") submitted its "Operation Plan and License Application" in March, 1990, for Site E, federal regulations applicable to landfill sites had not yet been promulgated, specifically 40 CFR Part 258. Although these regulations, often referred to as Subtitle D will not become effective until October 9, 1993, or shortly thereafter, they will apply to and effect all aspects of Site E. When the County submitted its application in 1990, it submitted a "preliminary design" and an application for licensure in response to the current solid waste management regulations as set forth in ARM 16.14.4, 5, and 7. The application was not submitted in compliance with Subtitle D requirements.

New and existing landfills, including Site E will have to comply with the requirements of Subtitle D. When Lewis and Clark County submits its final design and operations plan for Site E it will have to demonstrate compliance with Subtitle D. DHES appears to acknowledge this obligation in Chapters Two and Five of the DEIS (pp.2-6 and 5-4). Table 2.1.1 in the DEIS, entitled "Summary and Comparison of Solid Waste Regulations" (existing Montana solid waste rules and Subtitle D requirements), demonstrates the differences between the two sets of regulations on various landfill requirements. The differences are distinct and costly. The County has also publicly indicated its intention to comply with Subtitle D requirements. At the May 17, 1993, public hearing on the DEIS, County Commissioner Blake Wordal indicated the County's intention to comply with Subtitle D. G-7

ARM 16.2.636, a DHES MEPA rule entitled "Supplements to Environmental Impact Statements," requires DHES to prepare a supplement to a draft or final EIS whenever, among other reasons, "there are significant new circumstances, discovered prior to final agency decision, including information bearing on the proposed action or its impacts that change the basis for the decision". The impacts of Subtitle D on Site E are numerous--not only in terms of environmental protection, but also costs. The applicability and impact of Subtitle D on the Site E proposal compels that a supplement be done on the DEIS, and that the DEIS comprehensively evaluates a final design plan in accordance with Subtitle D. G-8

III. SOCIOECONOMICS AND COSTS OF SITE E

The discussion on economic benefits and costs of Site E is totally deficient. ARM 16.2.632 requires that the DEIS contain a description of the impacts on the quality of the human environment of the proposed action including but not limited to: "(e) the economic and environmental benefits and costs of the proposed action." The DEIS fails to comply with the requirements of MEPA and implementing rules in its failure to provide this required analysis. G-9

Interestingly, in a letter of July 30, 1992, from the consultant (Woodward-Clyde Consultants, "WCC") to Mr. Dilliard, describing the content requirements for the DEIS, WCC points out and recognizes the public concern and request for a thorough economic and socioeconomic analysis of the proposal. On page 15 of the letter, it states as follows:

> "Public comment received during the scoping process indicates that concerned parties desire a level of economic and socioeconomic evaluation not anticipated in our proposal. We request guidance from SWMP regarding the level of analysis which will be required so that we may formulate response to comments and initiate our evaluations." (A copy of p.15 of the WCC letter is marked Attachment 4, and by this reference, incorporated herein.) G-10

Notably, comments requesting a thorough economic analysis were submitted to DHES by counsel for CFRL in a letter of July 13, 1991, specifying the scoping issues CFRL thought appropriate for inclusion in the DEIS. Even then, issues of cost for Site E and the impacts of Subtitle D on costs for the development of Site E were referenced and raised.

Written guidance from DHES to WCC cannot be found? Was there verbal guidance for this request? If so, what was it? If there was no guidance, why not?

The DEIS therefore fails to adequately address the comments raised through the scoping process, as required by MEPA rules (ARM 16.2.630) and the consultant's recommendation in light of those scoping comments concerning development and other costs of Site E. G-11

Cost Computation

How were the costs for Site E computed? Did the consultant develop the costs or were they supplied by the County? There is absolutely no cost projection breakdown that can be found in the DEIS or DHES landfill files. This information must be contained in G-12 the DEIS for review and comment and for purposes of comparison to alternatives. The "real" costs must be disclosed to the public. As required by DHES, CFRL urges that this information be included in a DEIS supplement so the information can be analyzed and commented upon as provided by MEPA and DHES MEPA rules. G-12

A sample of a state-of-the-art landfill cost projection for a Subtitle D landfill project is attached for the review and consideration of DHES and the consultant for utilization when they prepare the real costs associated with development of Site E. Even though this landfill cost estimate is for a landfill located outside of Montana, its "structure" and "detail" should be instructive for DHES, the consultant, and County when they develop the required economic analysis for Site E and the other sites and develop the comparisons. An article on cost development for a Subtitle D landfill is also attached. (The sample and article are marked Attachment 5 and 6, respectively, and by this reference, incorporated herein.) G-13

CFRL is concerned that the "final" tipping costs for Site E, will evolve and grow like the costs associated with the transfer station. Start off at one "reasonable" cost in order to "sell" it to the public, and at completion of the project, develop the real cost, substantially higher and unacceptable if it had been known originally. As an example, as early as April 1990, the Independent Record contained a story citing transfer station construction costs at $1.3 million. The costs have recently been cited as $2.1 million, and the bond issue offering cites the construction costs for the transfer station at $2.7 million! (A copy of the bond issue offering is marked Attachment 7, and by this reference, incorporated herein.) Will the costs associated with Site E, including compliance with Subtitle D, chart the same skyrocketing course of increases as the transfer station? The law and past county government practice require and compel a full disclosure of the Site E costs. G-14

The County recognizes that it has not yet prepared a cost projection/breakdown for the operation and other aspects of Site E. In a follow up letter to Mr. Bob Johnson from Mr. Frank Crowley of April 7, 1992, Mr. Crowley stated as follows:

> "This letter which follows up my previous request of April 7, 1993, for Site E costs, will confirm that on Thursday, April 22, 1993, you advised me that no such cost summary was yet available and that you would provide me with all these costs after you had a chance to confer with Mr. Damschen during the week of April 26, 1993". (A copy of this letter is marked as Attachment 8, and by this reference, incorporated herein.)

G-15

I have been told by Mr. Crowley, that, to date, he still has not yet received the cost summary referenced.

Why wasn't this information demanded by the state in order for it to prepare an adequate MEPA analysis on this issue? It must be demanded now so an adequate supplement can be prepared and the citizens can comment. On its face, the cost information for Site E is inadequate. G-15

1. Can the county and city taxpayer assume that the capital costs of Site E, listed as $6.2 to $9.7 million, will be tripled to somewhere between $18 and $27 million when the capital costs for the entire landfill are disclosed and set forth in the DEIS? G-16

2. What are the costs associated with financial assurance for closure, post-closure and contingencies associated with Site E as required by Subtitle D? G-17

3. What will be the debt necessary to construct, operate, and close Site E? G-18

4. What will the sanitation fees (tipping fees) be for the Site E debt service? G-19

5. What are the costs for landfill gas control (methane gas) and for the methane monitoring plan? G-20

6. What will be the approximate cost of the York Road upgrade which will be necessary after utilization to get to Site E? G-21

7. What are the costs of compliance for Site E and the other alternative sites to comply with Subtitle D? G-22

8. What is the cost of the composite liner and leachate collection system for Site E? G-23

9. What is the cost per acre for a composite liner? G-24

10. Where do the final design plans need to be modified for compliance with Subtitle D and how much will the changes cost? G-25

11. How much will the design cost? G-26

These and many other questions related to cost must be answered.

Cost is a compelling concern for CFRL. On p.2-14 of the DEIS, summarizing the site selection process for Phase II, Site A was cited as being ranked highest, but because Site E had the lower G-27 purchase price, Site A lost its preferred ranking and Site E was selected as the preference. What are the comparisons now? G-27

Bottom line, what will be the tipping fee per ton for residential and commercial use of Site E? The public has a right to know, and the DEIS, which is legally and practically intended to be a document of disclosure, must present those costs and the supporting and relevant analysis and data. G-28

IV. ALTERNATIVE SITE ANALYSIS INADEQUATE

MEPA and its implementing rules require a comparable analysis of the proposal and alternatives (section 75-1-201, MCA, and ARM 16.2.626, 631, 632). This analysis is needed in order for DHES to make a reasoned choice for its preferred alternative[2]. While the County, and perhaps DHES, believe that site selection may be a local government responsibility, DHES still has the obligation to discuss and evaluate alternative sites and options thoroughly and make its MEPA choice based on that. G-29

In its letter of July 30, 1992, WCC informed Mr. Dilliard that:

> "more site-specific data are required in order to provide a comparable evaluation of Site A or Site B in the DEIS. More site-specific data may be required for the Tenneson Site [now Ben Sale site] in order to provide a comparable evaluation in the EIS, but because this site is permitted it is likely to have at least as much baseline information as other sites being considered. ... Therefore, installation of five wells (two at Site B and three at Site A) would cost approximately $20,000 to $25,000." (p.14 of this letter is marked Attachment 9, and by this reference, incorporated herein.) (emphasis added) G-30

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[2] Site E was never ranked as the best site by the Solid Waste Study Committee ("SWSC"). On p.S-2 of the DEIS, it states: "In the final analysis, Site A ranked highest when ratings for the evaluation categories (environmental, sociological, economic) were combined. Upon review of these results, Site E was selected by SWSC as the first priority site, apparently because of the low purchase price for a much greater acreage, relative to Site A." (Rasmussen and Macefield, 1989) (emphasis added). See also Table 2.1-4 on p.2-14 of the DEIS. Now, in light of Mr. Wayne Miller's offer of May 28, 1993, to Lewis and Clark County on Site A, and Site A's previous highest ranking, DHES must reanalyze this alternative more thoroughly. G-31

This "data gap" still exists. No wells were drilled at Site B and only one well was drilled at Site A, not the three recommended by the consultant in order for it to perform the required alternative site analysis. G-30

Further, while the Waste and Litter Control title (Title 75, Chapter 10) expressly states that it is a public policy of this state that:

> "Private industry is to be utilized to the maximum extent possible in planning, designing, managing, construction, operating, manufacturing, and marketing functions related to solid waste management systems . . .",

the Ben Sale site was only minimally analyzed in terms of impacts and costs, and no consideration was given to transporting wastes out of county. G-32

Regarding the transporting of waste out of county, since the City of Helena has now entered into an agreement to transport waste to a private solid waste concern in Great Falls, this "other alternative" must be more comprehensively analyzed against Site E in the DEIS supplement. The analysis must cover both environmental impacts and, of course, costs--especially since the waste will be transported and disposed of at a cost of approximately $25.00 per ton. Is this alternative the best environmentally? The Great Falls site is already "disturbed and developed," and the costs appear to be less than present Site E costs and substantially less than Site E costs after compliance with Subtitle D. Further, this analysis must be independently prepared. This analysis is critical and must occur. G-33

Mr. Verwolf, at the public hearing on the DEIS, stated that if costs of transporting waste to Great Falls were cheaper than Site E tipping fees, Site E development would be indefinitely delayed. Even if tipping fees at Site E were somewhat lower than the tipping and transporting fees for the Great Falls site, this alternative must still be more fully analyzed. The environmental impacts have already occurred at the Great Falls site and must be evaluated against the Site E tipping fees and the "new" environmental impacts to occur at Site E. Since the "relative impact of change" at the Great Falls site is not nearly as great as to Site E, that lesser impact must be weighed against the fees for Site E, even if the Site E fees are higher. G-34

It must be noted that the discussion of alternatives should not be limited to measures which the particular agency or official can adopt (see Cady v. Morton, 527 F.2d 786 [1975]). In Cady, the court also held that it is not appropriate to disregard alternatives merely because they do not offer complete solutions to G-35 the problem. The discussion of environmental effects of alternatives need not be exhaustive, but must provide information sufficient to permit a reasoned choice. An examination of reasonable alternatives is required (Mt. Wilderness Assoc. v. Board of Natural Resources, 200 M11, 648 P.2d 734 [1982]), and the analysis of the Great Falls and Ben Sale sites are not only "bounded by some notion of feasibility" but are reasonable and operational landfill sites. G-35

DHES has the duty and responsibility under MEPA to discuss reasonable alternatives and to choose the preferred alternative based on the environmental analysis in the MEPA document. Discussion of the Great Falls waste management alternative, and a more thorough discussion of the Ben Sale site, must occur as a matter of law in the DEIS if the document is to meet the requirements of MEPA and its implementing rules. G-36

Montana federal court cases have also addressed the issue of alternatives. In Libby Rod & Gun Club v. Poteat, 457 Supp. 1177 (1978), the court held that the EIS did not sufficiently consider the alternatives to construction of a dam and said in pertinent part as follows:

> "This is the essence of the requirement to consider all alternatives, not just those within the particular agency's jurisdiction. ...The Court sympathizes with the fact that some of the necessary information was not available to the Corps at the time EIS-Supplement I was compiled. Nonetheless, an agency is under an obligation to reassess a project as more information becomes available. By enacting NEPA, Congress mandated that all agencies, all competing energy industries that seek permits from agencies, must take a comprehensive and responsible approach to development of our nation's resources, rather than piecemeal, myopic approaches."

G-37

Likewise, DHES should not idly sit by and let the County pursue a "myopic and piecemeal" approach when other alternatives have presented themselves for comparative analysis. It must be noted that not only has the City of Helena entered into a contract with Great Falls Solid Waste Management to receive its solid waste after the DEIS was begun, but Mr. Ben Sale has also submitted to DHES a "Preliminary Design Outline for the Ben Sale Landfill" located in Jefferson County. This information and agreement cannot be ignored in the alternative site analysis.

Comparative analysis of all alternatives is even more significant in light of Subtitle D. For example, on p.2-11 of the DEIS, it states that Sites B & C would require liner systems, thereby increasing capital and development costs, while Sites A & G-38

E would not. Now, in light of the imminent applicability of Subtitle D, all sites will need composite liners, and therefore the alternatives should be compared accordingly. G-38

In the Summary section on p.S-13 of the DEIS, regarding Alternative 3, the City-County Sanitation Service ("CCSS") landfill site, it is noted as follows:

> "Land use would more quickly be converted from dryland farming to industrial, but the CCSS site is already a municipal landfill and the relative impact of the change would not be as great as for either Site E or Site A." (emphasis added)

Yet, in Chapter 5 (Comparison of Alternatives and DHES Preferred Alternative), no mention is made of this significant lack of impact at the CCSS site; how it was dealt with in the comparison of the alternatives; and ultimately how it was dealt with in the development of the DHES preferred alternative. This void must be addressed and a substantive analysis provided. G-39

Further, as to the CCSS site, the DEIS states that "a compelling argument for consideration of the CCSS facility involves privatization." The DEIS cites the aggressive federal implementation schedule, financing capabilities of private entities, and minimization of risk to governments when private industry is involved in the construction and operation of a solid waste management system, in support of the privatization option. Yet, the balancing of this "privatization" feature, which is also emphasized in Montana's Solid Waste Act, is never enunciated in Chapter 5 of the DEIS dealing with comparison of alternatives and development of the DHES preferred alternative. G-40

The "data gap" described in the WCC letter of July 30, 1992 (Attachment 9), and the scoping and EA comments submitted by counsel for CFRL, must be closed and addressed in order for this DEIS to meet the requirements of MEPA. As pointed out in the WCC letter, three wells were recommended to be drilled at site A--only one was drilled. The DEIS states that "to help correct" but not eliminate this deficiency, DHES drilled a test boring site in December, and in so doing overrode the recommendation of its own consultant. This "data gap" is noted in the DEIS. It says: G-41

> ". . . However, a site-specific conclusion would be based on the local geologic conditions and groundwater flow gradient. Although Site A is apparently underlain to some extent by low permeability materials, additional subsurface characterization would be needed to draw confident conclusions."

In other words, no scientifically defensible conclusion can be drawn regarding the susceptibility of the aquifer system to potential contamination without further work. G-42

The fact is, site specific data for the alternative sites chosen for analysis has not been obtained. DHES and the County have failed to secure the additional data recommended by the consultant in order to do the "standard" type of comparable alternative site analysis normally performed in an EIS. G-43

Finally, no analysis was made of a "regional waste disposal management system." This would be a logical alternative since it appears at the present time that all landfill sites must comply with Subtitle D in the future. Since the cost of compliance will be high and unrealistic for certain communities to finance, the exploration of a "regional site" is logical, reasonable, and cost effective. We urge that such an alternative be developed and analyzed in a supplement. G-44

V. CUMULATIVE IMPACT ANALYSIS IS INADEQUATE

DHES MEPA rules clearly require the DEIS to describe the cumulative impacts of the proposed action and alternatives (ARM 16.2.632). The DEIS discusses, in varying degrees, the cumulative impacts at Site E and the alternatives for each of the environmental aspects considered.

"MEPA and DHES rules implementing MEPA require a consistent, comparable analysis of the proposed action and alternative actions." (See p.S-5 of DEIS) This legal requirement has not been fulfilled and renders this DEIS inadequate on its face. The development of alternatives and the analyses must be redone in order to comply with MEPA. G-45

The failure of the DEIS to even deal with the remaining landfilling 109 acres (Phase II and Phase III) as real "cumulative impacts" of Phase I, further places the DEIS totally out of compliance with MEPA and its implementing rules. ARM 16.2.632(b) and case law REQUIRE that the DEIS contain an analysis of the "cumulative impacts" resulting from the proposed action. The DEIS is deficient for this additional reason. G-46

While the DEIS fails to analyze the application as submitted for the entire Site E landfill, the DEIS is, ironically, also silent on analyzing the impacts of Phase II and Phase III through a cumulative impact analysis. Not only are Phase II and III "reasonably foreseeable," they are part of the application, purchased for landfilling, and described in the County's application as the "useable acreage" for the landfill. G-47

ARM 16.2.625 defines "cumulative impacts" as:

> "the collective impacts on the human environment of the proposed action when considered in conjunction with other past and present actions related to the proposed action by location or generic type. Related future actions must also be considered by any state agency through pre-impact statement studies, separate impact statement evaluations or permit processing procedures."

In addition, ARM 16.2.627, entitled "Determining the Significance of Impacts," states that in order to comply with MEPA, DHES has a duty to determine the "significance of impacts associated with a proposed action." The rule goes on further to state that the determination of significance is the basis of the DHES decision to prepare an EIS and also refers to the agency's evaluation of individual and cumulative impacts on an EIS. G-48

Failure by DHES to address the development of Phases II and III as landfill sites in any fashion further renders the DEIS inadequate.

VI. THE DHES PREFERRED ALTERNATIVE IS INCONSISTENT WITH MEPA

The DEIS states as follows on p.S-15:

> "Therefore, since the proposed action meets all of the current licensing requirements for a solid waste management system in Montana, the Department's proposed decisions to grant the license application for Site E as submitted by the applicant."

In Chapter 5, "Comparison of Alternatives and DHES Preferred Alternative," the DEIS also states:

> "However, since the Department does not have the jurisdiction to mandate the incorporation of the modifications into the proposed action, and since the proposed action meets all of the current licensing requirements for a solid waste management system in Montana, the Department's proposed decision is to grant the license application for Site E as submitted by the applicant." (emphasis added) G-49

Clearly, DHES recommended what it viewed to be the best "licensing" alternative and not the best "environmental" alternative. By tying its preferred alternative to the ability of Site E to meet licensing requirements, DHES has eliminated the underlying purpose of MEPA--to designate as its preferred alternative the site having the least significant impacts on the human environment. DHES' duty under MEPA is to disclose to the public which site it believes will have the least impacts. G-49

If the DHES' proposed decision were to license a site, with or without composting, which is not the preferred alternative because the agency believes that the proposal meets all of the applicable licensure requirements, that would at least be understandable under DHES' interpretation of MEPA. Its duty, however, is to choose as its "preferred alternative" the site it believes to have the least significant impact on the human environment and to explain its reasons for such preference. G-50

DHES' apparent discomfort with conflicts between its "proposed licensing decision" and a "preferred alternative" has forced it to prepare a DEIS that reaches a result-oriented conclusion that is not supported under a MEPA-required analysis.

VII. OTHER COMMENTS ON DEIS

The DEIS states that it will evaluate the environmental impacts in light of Subtitle D rules (see p.4-2 of DEIS). In many areas of analysis, however, it doesn't. For example:

1. "It is expected to comply with Subtitle D (or final state regulations) and provide additional ground and surface water protection." (p.4-5 of DEIS)

2. "It is expected that the existing landfill will require upgrades to comply with Subtitle D, regardless of an expansion to accommodate future disposal of Lewis and Clark County waste." (p. 4-9 of DEIS) G-51

3. ". . . but compliance with Subtitle D would necessitate changing the landfill design to include a Subtitle D liner system." (p.4-10 of DEIS)

What are the design upgrades necessary to provide additional ground and surface water protection? Will they be adequate? What upgrades will Subtitle D specifically require? How will the design be changed to reflect a liner system? Will it be adequate and what is it?

The DEIS describes Subtitle D requirements and the deficiencies of the existing landfill design. MEPA requires an analysis of the environmental impacts, not just a description of present and future regulatory requirements. This analytical deficiency occurs throughout the DEIS and must be remedied. The relevant and material information must be disclosed. G-52

Mr. Tom Morrison's, Mr. Jeff Claassen's, Mr. Clebe Amundson's, and Mr. Roger Sandiland's comments made at the May 17 public hearing and written comments submitted on the DEIS are noted, and by this reference, incorporated herein.

CONCLUSION

DHES is urged to prepare a supplement to the DEIS and analyze the application for a landfill at Site E as submitted. DHES is also urged to address and analyze the other concerns and deficiencies in the supplement. Inclusion of such additional information and analysis in the Final EIS would preclude the public from having the opportunity to comment on the new and necessary information and analysis. G-53

As prepared, the DEIS is inadequate under MEPA and DHES' rules implementing MEPA. G-54

--END--

Attachment
#1

CLASS II SANITARY LANDFILL

OPERATION PLAN
AND
LICENSE APPLICATION

PREPARED FOR

SCRATCHGRAVEL LANDFILL
DISTRICT BOARD

RECEIVED
MAR 16 1990
Montana Department of Health
and Environmental Sciences
Solid and Hazardous Waste Bureau

March, 1990

Damschen & Associates, Inc.
CONSULTING ENGINEERS
Helena, Mt.

Attachment
1

SCRATCHGRAVEL LANDFILL APPLICATION

A. General

The proposed site is located approximately 10 miles northeast of Helena. The County is purchasing the site from Mr. Deal and Mr. Plymale. The site will serve the City of Helena and the Scratchgravel Landfill District. It is estimated that the site will receive approximately 40,000 tons of waste per year including both Group II and Group III type wastes. The site is 360 acres in size and is currently used for grain production.

The actual area to be landfilled is approximately 180 acres. It is anticipated that this area will have sufficient capacity to dispose of the waste generated in the City and Scratchgravel District for approximately 91 years, depending upon the quantity of waste generated over the period. The location of the landfill site and areas in which waste will be deposited is shown on the enclosed plan sheets.

B. Summary of Hydrogeology of The Site

Included herein as a part of this application is a summary of hydrogeologic conditions of the site. To identify these characteristics the firm of Chen-Northern, Inc. was retained. A copy of their report, is included in Appendix B. Based on this information the following conclusions can be drawn.

1. General Soils Conditions

Geologic and hydrogeologic investigative activities completed at the location of the proposed new Class Ii landfill indicate the site is underlain by a relatively thick sequence of Tertiary volcaniclastic sediments. The predominate subsurface material types are clayey sand and clay with fine sand. Permeability tests conducted on samples of the base materials indicate hydraulic conductivities ranging from 2.1×10^{-5} cm/sec to 2.2×10^{-8} cm/sec. Atterburg limit tests indicate the clay has a Plastic Index of 54 to 101 indicative of a highly plastic, expansive clay.

Relatively thin water bearing sand and gravel lenses are interbedded within the finer grained sediments and are present at depths ranging from 28 to 160 feet below the ground surface. Hydraulic conductivities of the water bearing sand and gravel lenses encountered beneath the site range from 3.0×10^{-4} cm/sec to 8.2×10^{-6} cm/sec.

2. Groundwater

Groundwater under artesian pressure was encountered in sand and gravel lenses located 28 feet below ground surface on the western most edge of the proposed landfill site and at 173 feet below ground surface near the east boundary of the site. Static water levels at the site range from 14 to 130

Attachment
2

MONTANA DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES
Solid & Hazardous Waste Bureau
Cogswell Building, Room B-201
Helena, Montana 59620

APPLICATION FOR A SOLID WASTE MANAGEMENT SYSTEM LICENSE

1. Name of proposed facility: Scratchgravel Landfill

Address of proposed facility: 10 miles NE of Helena

Name of applicant: Scratchgravel Landfill District Board

Address of applicant: City County Building, Helena, MT 59623

Facility telephone: None Other telephone: 443-1010 Ext. 362

2. This application is for a: (x) solid waste disposal site, ( ) container site (green box and bulk containers), ( ) transfer station, ( ) resource recovery or processing facility, ( ) other (please specify) ________

3. a) Legal description of proposed location: E ½, Section 32, T11N, R2W

b) General description of facility location: Located south of Deal Lane and 3/4 miles east of Lake Helena Drive

4. If you are not the owner of the premises, give name and address of lessor who holds title to the property and attach a copy of the lease or rental agreement. Copy attached: ( ) Yes (x) No

The site is being purchased from Mr. Deal & Mr. Plymale
Name: ________ Address: ________

5. Please attach the following:

a) Map of city or county showing the proposed location of facility, with indications noting adjacent residences and access roadways.
Map attached? (x) Yes ( ) No

b) Plan of proposed facility showing the type and adequacy of fences for litter control and access control, and location of buildings and on-site roadways. Plan attached? (x) Yes ( ) No

6. Total acreage of proposed site: 320 acres

Acreage usable for the solid waste system: 189 acres

7. Population to be served by solid waste management system: 40,000

8. Will bridges and roads support loaded vehicles? (x) Yes ( ) No

9. Is any portion of site within 100 year floodplain? ( ) Yes (x) No

(continued on page 2)

10. Are natural drainages found within the site? (If "yes", indicate on map or furnish a topographic map.) (x) Yes ( ) No

11. Depth to groundwater (attach copies of well logs and site-specific hydrogeological report): 28 to 173 feet

12. Distance from public or private water supplies (indicate locations of wells on map): See Appendix B

13. Are there springs located within one mile of site? (If "yes", indicate locations on map.) See Appendix B (x) Yes ( ) No

14. Attach hydrogeological and soil information on the proposed site, including a soil profile to a depth ten (10) to twenty (20) feet below lowest point solid waste will be deposited. Hydrogeological report attached: (x) Yes ( ) No

15. In order to properly characterize and evaluate the impact of the proposed site on groundwater resources, it is nearly always necessary to plan a groundwater monitoring system for landfills. Usually, this plan will be prepared by a qualified consultant. Have you included such a plan for this proposed site, if the site is intended for burial of wastes? (x) Yes ( ) No

16. Attach operation and maintenance plan. Include days and hours site open, fencing and access control, equipment used at site, how traffic will be directed and controlled, general description of solid waste management system, maintenance schedule regarding handling and disposal of solid wastes, provisions for litter control, types of waste to be accepted, proposed use of the land after fill area completed, person(s) responsible for operation and maintenance of solid waste management system. The operation and maintenance plan must indicate what measures will be taken to insure that drainage is properly handled in order to keep water from entering the waste burial area. Please refer to Administrative Rules of Montana (ARM), Rules 16.14.520 and 16.14.521 for minimum operation and maintenance requirements.
Plan attached: (x) Yes ( ) No

17. Few sites can be properly planned or operated without a "cut-and-fill" plan. Generally, this plan must be prepared by a qualified individual with experience in landfill design. Have you included a plan of this kind with your application? (x) Yes ( ) No

18. Will open burning of untreated wood waste be a part of the operation and maintenance plan? (x) Yes ( ) No

19. Will any special or unusual wastes (those which require special handling or present unique environmental hazards) be accepted? ( ) Yes (x) No

If "yes", briefly describe the wastes (use additional sheet if necessary):

20. Do you plan to accept household quantities of hazardous wastes and/or hazardous wastes from conditionally exempt generators? (Note: These types and quantities of waste may be legally accepted at state licensed "Class II" landfill facililities.) (x) Yes ( ) No

(continued on page 3)

21. Describe adjacent use of land and attach a list of names and addresses of persons owning land adjacent to the proposed facility:

Grazing and farmland, Frank Miller, Robert Simpson, Wayne Miller, Bill Greenfield

List Attached: ( ) Yes (x) No

22. Describe the estimated life of the facility and attach a description of the method used to calculate this figure. Description attached: ( ) Yes ( ) No
Estimated life: 91 Years

23. Attach a closure plan for the landfill including final cover soil specifications, showing elevations and drainage details, revegetation requirements and other pertinent details of site closure. Address the proposed use of the landfill upon completion. Plan attached: (x) Yes ( ) No

24. What is the proposed opening date for this facility? September 1, 1990

25. Provide name and address of insuror of facility and/or attach copy of your general liability insurance policy. Provide a statement regarding the limits of the policy for sudden and non-sudden liability coverage.
Statement of Coverage attached: (x) Yes ( ) No

Name of Insuror: Montana International Address: Helena, MT

26. Will underground tanks or lines be located at the site? ( ) Yes (x) No

If "yes" have you completed EPA form 7530 (11-85) Rev. 2-86, Notification for Underground Storage Tanks? ( ) Yes ( ) No

If "yes", what is your facility I.D. Number? ______

****

27. I herby certify that the site of the planned solid waste management system is in accordance with local government zoning and ordinances (to be signed by appropriate local government official having knowledge of local zoning ordinances).

Signature: Robert S Rasmussen Title: County Planner

Representing: Lewis & Clark County Date: 3-15-90
(city or county)

****

I am a party responsible for operation of this proposed facility. I certify that the above described solid waste management system will be constructed and operated in accordance with Section 75-10-201 through 75-10-233, Montana Code Annotated (MCA), the rules adopted pursuant thereto, and in accordance with conditions which have or may be imposed in the license.

Signature: (to be signed by applicant) Dave Marshall

Title: Solid Waste Division Manager Date: 3/15/90

CERTIFICATE OF INSURANCE

ISSUE DATE (MM/DD/YY) 3-14-90

ER
PENCo
21 N. Last Chance Gulch
P.O. Box 1689
Helena, MT 59624

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURED
Lewis & Clark County
316 N. Park Avenue
P.O. Box 1724
Helena, MT 59624

COMPANIES AFFORDING COVERAGE

COMPANY LETTER A	Montana Association of Counties
COMPANY LETTER B	Underwriters at Lloyds of London 75%
COMPANY LETTER C	Northfield Insurance Company 25%
COMPANY LETTER D	St. Paul Surplus Lines Ins Co.
COMPANY LETTER E	Twin City Fire Ins. Company

COVERAGES

THIS IS TO CERTIFY THAT POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS, AND CONDITIONS OF SUCH POLICIES.

CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	ALL LIMITS IN THOUSANDS	
A B C	GENERAL LIABILITY X COMMERCIAL GENERAL LIABILITY ☐ CLAIMS MADE ☒ OCCURRENCE X OWNER'S & CONTRACTOR'S PROTECTIVE X ~~Premises Operat~~ions X ~~Contractual~~	101901500	1-1-89	7-1-90	GENERAL AGGREGATE	$ N/A
					PRODUCTS-COMP/OPS AGGREGATE	$ INCL
					PERSONAL & ADVERTISING INJURY	$ INCL
					EACH xxxxx claim	$ 250
					FIRE DAMAGE (ANY ONE FIRE)	$
					MEDICAL EXPENSE (ANY ONE PERSON)	$
A B C	AUTOMOBILE LIABILITY X ANY AUTO ☐ ALL OWNED AUTOS ☐ SCHEDULED AUTOS X HIRED AUTOS X NON OWNED AUTOS ☐ GARAGE LIABILITY	101901500	1-1-89	7-1-90	CSL	$ 250 each claim
					BODILY INJURY (PER PERSON)	$
					BODILY INJURY (PER ACCIDENT)	$
					PROPERTY DAMAGE	$
D	EXCESS LIABILITY ☐ X OTHER THAN UMBRELLA FORM	LC05519758	1-1-89	7-1-90	EACH XXXXX $ / XXXXE $	750 any one claim
	WORKERS' COMPENSATION AND EMPLOYERS' LIABILITY				STATUTORY	
					(EACH ACCIDENT)	$
					(DISEASE-POLICY LIMIT)	$
					(DISEASE-EACH EMPLOYEE)	$
A B C E	OTHER All Risk Property including Flood & Earthquake	101901500 72XLSSD3032	1-1-89 1-1-89	7-1-90 7-1-90	Policy Limit $25,000,00 $1000 maintenance Ded. will apply to each & every loss.	

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/RESTRICTIONS/SPECIAL ITEMS

Scratch Gravel Landfill as respects General Liability Only.

CERTIFICATE HOLDER

Department of Health
Solid & Hazardous Waste Bureau
Capitol Complex
Helena, MT 59601

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ENDEAVOR TO MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

Greg Jackson, lcc

© IIR/ACORD CORPORATION 1985

Attachment 3

City-County Building
316 North Park
Helena, Montana 59623
Telephone 406/443-1010

LEWIS AND CLARK COUNTY

Scratch Gravel Landfill District

RECEIVED
MAR 18 1993
MONTANA DEPARTMENT [illegible]
AND ENVIRONMENT [illegible]
[illegible] HAZARDOUS [illegible]

March 17, 1993

John Dilliard
S & H Waste Bureau
836 Front St.
Helena, Mt. 59601

Dear John,

The solid waste license application submitted by the Lewis and Clark County Scratchgravel Solid Waste District Board for the so called 'Site - E' solid waste landfill location is to apply to Phase One of the project only. Any physical expansion of the project would be covered under additional license alteration requests submitted to the Solid Waste Bureau under separate cover.

I hope this clarifies the status of our license application. Please contact me if you have additional questions.

Sincerely,

Robert R Johnson

Robert R. Johnson
Scratchgravel Landfill District Manager

Attachment
4

- A comment received during the scoping period indicates that Site F may be available for sale to the County for use as a landfill. We believe it would be appropriate for the County (or a SWMP representative) to contact the owner of this site, and all other properties which may be evaluated in the EIS, to determine their availability for purchase.

- Public comment received during the scoping process indicates that concerned parties desire a level of economic and socioeconomic evaluation not anticipated in our proposal. We request guidance from SWMP regarding the level of analysis which will be required so that we may formulate response to comments and initiate our evaluations.

- Our assumption for the various landfill alternatives will be that a transfer station will be used regardless of the landfill location. This assumption is important because it ties the County and city of Helena to the permitted facility. It also provides an equal baseline for environmental analysis, especially regarding the number of vehicles entering the landfill and associated noise, dust, traffic, and safety impacts.

We believe these recommendations and data requirements are necessary to provide the environmental analysis required by MEPA and desired by the concerned public. I hope the information and recommendations provided in this letter assist you in determining the appropriate path to follow in the EIS. We look forward to your consideration of these issues and are ready to provide further discussion at your request. Please call me if you have questions or concerns.

Sincerely,

Ken Wallace
Ken Wallace
Project Manager

KAW:ssp

3 Atch: Summary Tables

cc: Jim Wilbur, SHWB
Mark Stahly, SHWB
Richard Bell, WCC-Denver
Laurie Batchelder Adams, WCC-Denver

DONEY, CROWLEY & SHONTZ

Attorneys at Law

Ted J. Doney
Frank C. Crowley*
John M. Shontz **
Albert W. Stone, *of Counsel* ***

Power Block Bldg., Suite 300
Sixth & N. Last Chance Gulch
P.O. Box 1185
Helena, Montana 59624
(406) 443-7018
Fax: (406) 449-8443

May 14, 1933

attachment
5

Mona F. Jamison
Power Block Bldg., Suite 4F
P.O. Box 1698
Helena, MT 59601

Re: Site E Costs

Dear Mona:

As a follow up to my earlier letter of today, I am enclosing a copy of a landfill cost estimate which was prepared by a Montana consulting firm (Blue Ridge Services of Bozeman) for a recent Subtitle D landfill project outside of Montana. I am sending this to you because it represents the kind of detailed landfill cost estimate that I have unsuccessfully been trying to obtain from Lewis and Clark County on Site E. Any reliable cost projections for a landfill project should be based upon a level of detail comparable to the one enclosed.

Please note that the specific costs in the estimate are based on the particulars of the out-of-state landfill. Site E would have its own specific cost components.

Thank you.

Sincerely,

Frank C. Crowley

Enc.

Specializing in water, natural resource & environmental law, and government relations

*Also admitted in Maine & Massachusetts **Also admitted in the District of Columbia ***Also admitted in California (inactive)

May 14, 1993

Doney, Crowley and Shontz
314 N Last Chance Gulch
Helena, MT

RE: Final Cost Analysis

Dear Frank,

Enclosed you will find the steps used by Blue Ridge Services to perform a cost analysis. They are representative of an actual landfill and what it costs to operate.

If you have any questions, please don't hesitate to call me at (406) 587-8771.

Respectfully,

Dave Prunty

Dave Prunty

FACILITY CONSTRUCTION COSTS:

Based on Phase I = 1 acres @ 10' deep excavation

1.	Site Access (.5 mile - upgrade only)	----
	Earthwork (10,000 yd @ $1.50)	----
	Gravel .5' x 26' @$15/yd	----
	Drainage	----
2.	Fill Area Earthwork	
	Clearing & Grubbing (16 hrs @ $50)	800
	Topsoil Excavation/Stockpiling	----
	Subsoil Excavation/Stockpiling	----
	Geogrid Placement/Soil Layers	67760
	(2 layers Geogrid @ $2.40/sq.yd for 2 acres)	
	(1 layer clay soil @ $7/yd)	
	Gravel Sub Layer	12907
	(1 acres @ 1' @ $ 4/yd)	
3.	Base Area Preparation	
	Clay Liner Placement	----
	Geomembrane Liner Placement	----
4.	Leachate Collection System	
	Drainage Blanket	----
	Collection System Piping	2,000
	(500' @ $4/ft)	
	Leachate Evaporation Pond	15,370
	(clay: 10,000 sq.ft @ 4' @ $7/yd) plus	
	(HDPE: 10,000 sf @ $0.50/sf)	
	Treatment Facility	0
	Subtotal:	98,837

5.	Surface Drainage System	
	Culverts, Down-drains	6,000
	Ditches	5,000
	Sedimentation Basin	12,000
6.	Environmental Controls	
	Leachate Monitoring Wells	0
	Groundwater Monitoring Wells	20,000
	Methane Monitoring System	4,000
	Perimeter Litter Fences (2000' @ $5/ft)	10,000
7.	Site Security	
	Fencing, gate, signs	2,000
8.	Site Improvements	
	Maintenance Building	incl.
	Scale/Scale house	40,000
	Elec. Power Install.	12,000
	Septic System	3,000
	Water Supply	5,000
	Radio System (incl. in oper. costs)	0
9.	Engineering/Construction Mgmt.	30,000
	CONSTRUCTION COST TOTAL:	247,837

EQUIVALENT COST PER TON: $2.97/TON

FACILITY OPERATING COSTS:		COST PER TON
1.	Fee Collection/Office	---
2.	Pre-Fill Stripping	---
3.	Refuse Handling	---
4.	Daily Cover	---
5.	Intermediate Cover	---
6.	Final Cover	---
7.	Equipment Maintenance	---
8.	Litter Control	---
9.	Security	---
10.	Administration	---
11.	Safety	---
12.	Drainage	---
13.	Signs	--
14.	Roads/Access	---
15.	Tipping Pads	---
16.	Leachate Management	---
17.	Methanc Control System	---
18.	Landfill Expansion	---
19.	Hand Tools	---
20.	State Surcharges/Fees	---

* Note: A detailed breakdown of operating costs is attached.

FACILITY OPERATING COST TOTAL: **$47.28**

EQUIVALENT COST PER TON: $47.28/TON

FACILITY CLOSURE COSTS:

1.	Closure Plan - included in cut/fill plans	0
2.	Certification	15,000
3.	Final Cover/Drainage (incl. in cut/fill plan)	0
4.	Financial Assurance Fund	100,014

To provide for 2 acres of closure (equip,labor,mat'ls) to perform final cover placement and seeding. 1.5' random soil @ $4/yd, 1' clay soil @ $7/yd and 1' topsoil @ $4/yd, HDPE liner @ $0.50/sf. Seeding cost based on $800/acre.

FACILITY CLOSURE COST TOTAL: 115,014

EQUIVALENT COST PER TON: $0.36/TON

ANNUAL FACILITY POST-CLOSURE COSTS:

1.	Annual Inspection	3,000
2.	Erosion Prevention/Repair	5,000
3.	Leachate Handling/Treatment	10,000
4.	Environmental Monitoring	10,000
5.	Contingency	4,200
6.	Amount to be set aside in Fund	32,200

must establish by 2013, an annuity to provide $32,200 per year indefinitely. Assume money is invested @ 8% / year.

P(8%) = $32,200

P = $402,500

To create a fund of $402500 in 20 years @ 8%,

F/A,8%,20, therefore,

A(45.7620) = $402500

A = $8,796

FACILITY POST-CLOSURE COST TOTAL: $8,796

EQUIVALENT COST PER TON: $1.49/TON

FACILITY COST PER TON:

1.	Predevelopment	1.64
2.	Facility Construction Costs	3.89
3.	Facility Operating Costs:	47.22
4.	Facility Closure Costs:	0.39
5.	Facility Post-Closure Costs:	1.35
	+ plus 15% Contingency	9.34
	TOTAL COST PER TON FOR FACILITY:	$54.27

ITEM NO	DESCRIPTION	UNITS	QUANTITY	$/UNIT	COST/TON
* FEE COLLECTION/OFFICE COLLECTOR					
1	S.T. (WEEKDAY)	HR/DAY	8	$9.24	$1.922
2	O.T. (WEEKDAY)	HR/DAY	0	$13.86	$0.000
3	S.T. (WEEKEND)	HR/DAY	0	$9.24	$0.000
4	O.T. (WEEKEND)	HR/DAY	0	$13.86	$0.000
5	HEATER	EA/PRO	10	$124.00	$0.006
6	HEATER ELEMENTS	EA/YR	1	$80.00	$0.008
7	HEATER FUEL	GAL/MO	40	$1.10	$0.053
8	HOME OFFICE OVERHEA	EA/MO			$0.000
9	FIELD OFFICE (BUY)	EA/PRO	1	$3,000.00	$0.015
10	FIELD OFFICE (INSTALL)	EA/PRO	1	$500.00	$0.003
11	FIELD OFFICE OVERHEAD	EA/MO			$0.000
12	OFFICE SUPPLIES	EA/MO	1	$30.00	$0.036
13	OFF. EQUIP. (MISC)	EA/PRO	4	$500.00	$0.010
14	TYPEWRITER	EA/PRO	2	$500.00	$0.005
15	DESKS	EA/PRO	8	$100.00	$0.004
16	CHAIRS	EA/PRO	8	$50.00	$0.002
17	FILES	EA/PRO	2	$150.00	$0.002
18	DRINKING WATER	EA/MO	10	$6.00	$0.072
19	ADDING MACHINE	EA/PRO	2	$75.00	$0.001
20	COPY MACHINE	EA/PRO	2	$2,000.00	$0.020
21	COPY MACH. MAINT.	EA/MO	1	$25.00	$0.030
22	TELEPHONE (USAGE)	EA/MO	1	$100.00	$0.120
23	TELE. SYSTEM (INSTALL)	EA/PRO	1	$1,200.00	$0.006
24	TELE. CONDUIT (INSTALL)	FT/YR	0.0	$1.79	$0.000
25	ELECTRICAL (USAGE)	EA/MO	1	$200.00	$0.240
26	ELECTRICAL (INSTALL)	FT/YR	0.0	$3.78	$0.000
27	BOOTH MAINTENANCE	EA/MO	0	$30.00	$0.000
28	OFFICE MAINTENANCE	EA/MO	0	$0.00	$0.000

ITEM NO	DESCRIPTION	UNITS	QUANTITY	$/UNIT	COST/TON
29	CASH/CHANGE MGMT.	EA/MO			$0.000
30	LIGHTING SYSTEM (LAMP	EA/YR			$0.000
31	BASE RADIO	EA/PRO	2	$1,200.00	$0.012
32	JANITORIAL SERVICE	EA/MO	0	$0.00	$0.000
33	TIME CARD CLOCK	EA/PRO	2	$400.00	$0.004
34	ELECTRIC CASH REGISTE	EA/PRO	3	$1,200.00	$0.018
35	MICROWAVE OVEN	EA/PRO	5	$300.00	$0.008
36	REFRIGERATOR	EA/PRO	2	$300.00	$0.003
* PRE-FILL STRIPPING:					
1	D6C DOZER	HR/DAY	0.5	$36.05	$0.469
	OPERATOR				
2	S.T. (WEEKDAY)	HR/DAY	0.5	$14.52	$0.189
3	O.T. (WEEKDAY)	HR/DAY		$21.78	$0.000
4	S.T. (WEEKEND)	HR/DAY	0	$14.52	$0.000
5	O.T. (WEEKEND)	HR/DAY		$21.78	$0.000
6	STAKING	HR/DAY	0	$0.00	$0.000
* REFUSE HANDLING:					
1	816B COMPACTOR	HR/DAY	3.00	$40.34	$3.147
	OPERATOR				
2	S.T. (WEEKDAY)	HR/DAY	3	$14.52	$1.133
3	O.T. (WEEKDAY)	HR/DAY	0	$21.78	$0.000
4	S.T. (WEEKEND)	HR/DAY	0	$14.52	$0.000
5	O.T. (WEEKEND)	HR/DAY	0	$21.78	$0.000
6	D6C DOZER	HR/DAY	3.00	$36.05	$2.812
	OPERATOR				
7	S.T. (WEEKDAY)	HR/DAY	3	$14.52	$1.133
8	O.T. (WEEKDAY)	HR/DAY	0	$21.78	$0.000
9	S.T. (WEEKEND)	HR/DAY	0	$14.52	$0.000

ITEM NO	DESCRIPTION	UNITS	QUANTITY	$/UNIT	COST/TON
10	O.T. (WEEKEND)	HR/DAY		$21.78	$0.000
11	#2 COMPACTOR	HR/DAY	0.00	$40.34	$0.000
	OPERATOR				
12	S.T. (WEEKDAY)	HR/DAY	0	$14.52	$0.000
13	O.T. (WEEKDAY)	HR/DAY	0	$21.78	$0.000
14	S.T. (WEEKEND)	HR/DAY	0	$14.52	$0.000
15	O.T. (WEEKEND)	HR/DAY	0	$21.78	$0.000
16	#2 DOZER	HR/DAY	0.00	$36.05	$0.000
	OPERATOR				
17	S.T. (WEEKDAY)	HR/DAY	0	$14.52	$0.000
18	O.T. (WEEKDAY)	HR/DAY	0	$21.78	$0.000
19	S.T. (WEEKEND)	HR/DAY	0	$14.52	$0.000
20	O.T. (WEEKEND)	HR/DAY	0	$21.78	$0.000
21	ENGINEERING/STAKING	HR/DAY	0.10	$16.00	$0.042
22	MONITOR/INSPECTION	HR/MO	4	$16.00	$0.077
23	OPERATOR TRAINING	EA/MO	1	$100.00	$0.120
	SPOTTER				
24	S.T. (WEEKDAY)	HR/DAY	4	$9.24	$0.961
25	O.T. (WEEKDAY)	HR/DAY	0	$13.86	$0.000
26	S.T. (WEEKEND)	HR/DAY	0	$9.24	$0.000
27	O.T. (WEEKEND)	HR/DAY	0	$13.86	$0.000
28	? RECYCLING ?				
* DAILY COVER:					
1	D6C DOZER	HR/DAY	1	$36.05	$0.937
	OPERATOR				
2	S.T. (WEEKDAY)	HR/DAY	1	$14.52	$0.378
3	O.T. (WEEKDAY)	HR/DAY		$21.78	$0.000
4	S.T. (WEEKEND)	HR/DAY	0	$14.52	$0.000
5	O.T. (WEEKEND)	HR/DAY		$21.78	$0.000

ITEM NO	DESCRIPTION	UNITS	QUANTITY	$/UNIT	COST/TON
6	950 LOADER	HR/DAY	0	$33.99	$0.000
	OPERATOR				
7	S.T. (WEEKDAY)	HR/DAY	0	$14.52	$0.000
8	O.T. (WEEKDAY)	HR/DAY		$21.78	$0.000
9	S.T. (WEEKEND)	HR/DAY	0	$14.52	$0.000
10	O.T. (WEEKEND)	HR/DAY		$21.78	$0.000
11	627B SCRAPER	HR/MO	0	$65.92	$0.000
	OPERATOR				
12	S.T. (WEEKDAY)	HR/MO	0	$14.52	$0.000
13	O.T. (WEEKDAY)	HR/MO	0	$21.78	$0.000
14	S.T. (WEEKEND)	HR/MO	0	$14.52	$0.000
15	O.T. (WEEKEND)	HR/MO	0	$21.78	$0.000
16	SOIL	YD/DAY	60	$5.00	$7.800
17	STAKING/VERIFICATION	HR/MO	0	$0.00	$0.000
18	MAINTENANCE	HR/MO	0	$0.00	$0.000
19	ON-SITE HAULING	YD/DAY	0	N/A	$0.000
* INTERMEDIATE COVER:					
1	D6C DOZER	HR/DAY	0.2	$36.05	$0.187
	OPERATOR				
2	S.T. (WEEKDAY)	HR/DAY	0.2	$14.52	$0.076
3	O.T. (WEEKDAY)	HR/DAY		$21.78	$0.000
4	S.T. (WEEKEND)	HR/DAY	0	$14.52	$0.000
5	O.T. (WEEKEND)	HR/DAY		$21.78	$0.000
6	627B SCRAPER	HR/DAY	0.10	$65.92	$0.171
	OPERATOR				
7	S.T. (WEEKDAY)	HR/DAY	0.1	$14.52	$0.038
8	O.T. (WEEKDAY)	HR/DAY		$21.78	$0.000
9	S.T. (WEEKEND)	HR/DAY	0	$14.52	$0.000
10	O.T. (WEEKEND)	HR/DAY		$21.78	$0.000

ITEM NO	DESCRIPTION	UNITS	QUANTITY	$/UNIT	COST/TON
11	SOIL	YD/DAY	20	$5.00	$2.600
12	STAKING/VERIFICATION	HR/MO	0	$0.00	$0.000
13	MAINTENANCE	EA/MO	1	$100.00	$0.120
14	ON-SITE HAULING	YD/DAY	0	N/A	$0.000
* FINAL COVER	(based on 1 acre/year)				
1	D6C DOZER	HRS/YR	40.0	$36.05	$0.144
	OPERATOR				
2	S.T. (WEEKDAY)	HRS/YR	40.0	$14.52	$0.058
3	O.T. (WEEKDAY)	HRS/YR	0.0	$21.78	$0.000
4	S.T. (WEEKEND)	HRS/YR	0.0	$14.52	$0.000
5	O.T. (WEEKEND)	HRS/YR	0.0	$21.78	$0.000
6	627B SCRAPER	HRS/YR	40.0	$65.92	$0.264
	OPERATOR				
7	S.T. (WEEKDAY)	HRS/YR	40.0	$14.52	$0.058
8	O.T. (WEEKDAY)	HRS/YR	0.0	$21.78	$0.000
9	S.T. (WEEKEND)	HRS/YR	0.0	$14.52	$0.000
10	O.T. (WEEKEND)	HRS/YR	0.0	$21.78	$0.000
11	140G MOTOR GRADER	HRS/YR	40.0	$27.81	$0.111
	OPERATOR				
12	S.T. (WEEKDAY)	HRS/YR	40.0	$14.52	$0.058
13	O.T. (WEEKDAY)	HRS/YR	0.0	$21.78	$0.000
14	S.T. (WEEKEND)	HRS/YR	0.0	$14.52	$0.000
15	O.T. (WEEKEND)	HRS/YR	0.0	$21.78	$0.000
16	815 DIRT COMPACTOR	HRS/YR	40.0	$27.81	$0.111
	OPERATOR				
17	S.T. (WEEKDAY)	HRS/YR	40.0	$14.52	$0.058
18	O.T. (WEEKDAY)	HRS/YR	0.0	$21.78	$0.000
19	S.T. (WEEKEND)	HRS/YR	0.0	$14.52	$0.000
20	O.T. (WEEKEND)	HRS/YR	0.0	$21.78	$0.000

ITEM NO	DESCRIPTION	UNITS	QUANTITY	$/UNIT	COST/TON
21	RANDOM SOIL	YD/YR	800	$5.00	$0.400
22	CLAY SOIL	YD/YR	800	$7.00	$0.560
23	HDPE LINER	SF/YR	50000	0.5	$2.500
24	TOPSOIL	YD/YR	400	$5.00	$0.200
25	STAKING/VERIFICATION	HRS/YR	0.0	$0.00	$0.000
26	MAINTENANCE	SQ.FT/Y	1,000	$0.30	$0.030
27	ON-SITE HAULING	YD/YEA	0	$0.00	$0.000
28	SEEDING	ACRES/	0.5	$800.00	$0.040
* EQUIPMENT MAINTENANCE:					
1	MECHANICS' TRUCK	HR/DAY	0.2	$14.37	$0.075
	MECHANIC				
2	S.T. (WEEKDAY)	HR/DAY	0.2	$14.52	$0.076
3	O.T. (WEEKDAY)	HR/DAY	0	$21.78	$0.000
4	S.T. (WEEKEND)	HR/DAY	0	$14.52	$0.000
5	O.T. (WEEKEND)	HR/DAY	0	$21.78	$0.000
6	FIELD SHOP (BUY)	EA/PRO	1	$30,000.00	$0.150
7	FIELD SHOP (INSTALL)	EA/PRO	0	$0.00	$0.000
8	FIELD SHOP OVERHEAD	EA/MO	1	$50.00	$0.060
9	STORAGE BLDG (BUY)	EA/PRO	2	$2,000.00	$0.020
10	STORAGE BLDG (INSTALL	EA/PRO	0		$0.000
11	STORAGE BLDG OVERHE	EA/MO			$0.000
12	HEATER	EA/PRO	10	$124.00	$0.006
13	HEATER ELEMENTS	EA/YR	1	$80.00	$0.008
14	HEATER FUEL	GAL/MO	40	$1.10	$0.053
15	OFFICE SUPPLIES	EA/MO	0	$0.00	$0.000
16	OFF. EQUIP. (MISC)	EA/PRO	0	$0.00	$0.000
17	DRINKING WATER	EA/MO	0	$0.00	$0.000
18	DESKS	EA/PRO	2	$100.00	$0.001
19	CHAIRS	EA/PRO	4	$100.00	$0.002

ITEM NO	DESCRIPTION	UNITS	QUANTITY	$/UNIT	COST/TON
20	FILES	EA/PRO	2	$100.00	$0.001
21	TELEPHONE (USAGE)	EA/MO	1	$30.00	$0.036
22	TELE. SYSTEM (INSTALL)	EA/PRO	1	$300.00	$0.002
23	TELE. CONDUIT (INSTALL)	FT/YR			$0.000
24	ELECTRICAL (USAGE)	EA/MO	1	$50.00	$0.060
25	ELECTRICAL (INSTALL)	EA/PRO	1	$2,000.00	$0.010
26	OFFICE MAINTENANCE	EA/MO	0	$0.00	$0.000
27	LIGHTING SYSTEM (LAMP	EA/YR	10	$5.00	$0.005
28	MOBILE RADIO	EA/PRO	2	$800.00	$0.008
29	WORK AREA (ROCK PAD)	SQ.FT/Y	200	$0.80	$0.016
30	MAINTENANCE	SQ.FT/Y	0	$0.05	$0.000
31	RAGS (wash/replace)	EA/WK	0.5	$15.00	$0.039
32	COVERALLS (wash/replac	EA/WK	0.5	$15.00	$0.039
* LITTER CONTROL:					
1	PICK-UP	HR/DAY	3	$4.40	$0.343
	LABORER				
2	S.T. (WEEKDAY)	HR/DAY	3	$9.24	$0.721
3	O.T. (WEEKDAY)	HR/DAY	0	$13.86	$0.000
4	S.T. (WEEKEND)	HR/DAY	0	$9.24	$0.000
5	O.T. (WEEKEND)	HR/DAY	0	$13.86	$0.000
6	BAGS	CASE/Y	5	$60.00	$0.030
7	TOOLS	EA/YR	2	$100.00	$0.020
8	TEMP FENCING	FT/YR	400	$1.80	$0.072
	LABORER				
9	S.T. (WEEKDAY)	HR/DAY	0.2	$9.24	$0.048
10	O.T. (WEEKDAY)	HR/DAY	0	$13.86	$0.000
11	S.T. (WEEKEND)	HR/DAY	0	$9.24	$0.000
12	O.T. (WEEKEND)	HR/DAY	0	$13.86	$0.000
13	PERM. STEEL FENCES	EA/PRO	20	$1,000.00	$0.100

ITEM NO	DESCRIPTION	UNITS	QUANTITY	$/UNIT	COST/TON
14	BACKHOE (DITCH)	HR/YR	0	$50.00	$0.000
	OPERATOR (DITCH)				
15	S.T. (WEEKDAY)	HR/YR	0	$0.00	$0.000
16	O.T. (WEEKDAY)	HR/YR	0	$0.00	$0.000
17	S.T. (WEEKEND)	HR/YR	0	$0.00	$0.000
18	O.T. (WEEKEND)	HR/YR	0	$0.00	$0.000
19	MOVE IN/OUT (DITCH)	EA/YR	0	$0.00	$0.000
* SECURITY:					
1	SECURITY SERVICE				
	S.T.	HR/DAY	0	$12.00	$0.000
	O.T.	HR/DAY	0	$0.00	$0.000
	HOLIDAY	HR/YR	0	$0.00	$0.000
2	FENCING	FT/YR	50	$10.00	$0.050
3	GATE	EA/YR	0.3	$750.00	$0.023
4	SAFE	EA/PRO	1	$2,000.00	$0.010
5	VIDEO SYSTEM	EA/PRO	2	$2,000.00	$0.020
* ADMINISTRATION:					
1	MANAGER - GENERAL	HRS/YR	0	$0.00	$0.000
2	SITE FOREMAN	HR/DAY	1	$14.52	$0.378
3	PICK-UP (SITE FOREMAN)	HR/DAY	1	$4.40	$0.114
4	INSURANCE	EA/MO			$0.000
5	ANNUAL AS-BUILT PLAN	EA/YR	1	$3,000.00	$0.300
6	DENSITY STUDY	EA/YR	0	$0.00	$0.000
7	OVERHEAD	EA/MO			$0.000
8	MOBILE RADIO	EA/PRO	2	$800.00	$0.008
* SAFETY:					
1	RAIN GEAR	EA/YR	6	$22.00	$0.013

ITEM NO	DESCRIPTION	UNITS	QUANTITY	$/UNIT	COST/TON
2	FIRE EXTINGUISHER	EA/YR	3	$84.40	$0.025
3	SAFETY MEETINGS	EA/MO	1	N/A	$0.000
4	EMERG. EYE WASH	EA/PRO	2	$400.00	$0.004
5	FIRST AID KIT	EA/YR	4	$70.00	$0.028
6	SAFETY CLOTHING	EA/YR	2	$60.00	$0.012
7	TRAFFIC VESTS	EA/YR	6	$6.00	$0.004
8	HARD HATS	EA/YR	12	$5.50	$0.007
9	GLOVES	EA/YR	20	$7.50	$0.015
10	EAR PLUGS	EA/YR	400	$0.21	$0.008
11	DUST MASKS	EA/YR	300	$0.27	$0.008
12	H2O TRUCK (DUST)	HR/DAY	0.5	$8.07	$0.105
	TRUCK DRIVER				
13	S.T. (WEEKDAY)	HR/DAY	0.5	$9.24	$0.120
14	O.T. (WEEKDAY)	HR/DAY	0	$13.86	$0.000
15	S.T. (WEEKEND)	HR/DAY	0	$9.24	$0.000
16	O.T. (WEEKEND)	HR/DAY	0	$13.86	$0.000
17	PORTABLE TOILET	EA/MO	1	$120.00	$0.144
18	FLARES	EA/MO	6	$1.50	$0.011
* DRAINAGE:					
1	ADS FLEX-DRAIN (8")	FT/YR	100	$3.10	$0.031
2	SAND BAGS	EA/YR	100	$0.30	$0.003
3	12" CMP	FT/YR	60	$16.00	$0.096
4	COUPLERS & BOLTS	EA/YR	3	$8.00	$0.002
5	STRAW BALES	EA/YR	40	$2.50	$0.010
* SIGNS:					
1	NO SMOKING	EA/PRO	4	$70.00	$0.001
2	HAZ MAT PROHIBITED	EA/PRO	4	$60.60	$0.001
3	REFUSE	EA/PRO	4	$70.00	$0.001

ITEM NO	DESCRIPTION	UNITS	QUANTITY	$/UNIT	COST/TON
4	SOIL	EA/PRO	4	$70.00	$0.001
5	CONCRETE/ASPHALT	EA/PRO	0	$70.00	$0.000
6	ROADSIDE REFLECTORS	EA/PRO	200	$6.00	$0.006
7	CONES	EA/PRO	40	$6.55	$0.001
8	OWNER IDENTIFICATION	EA/PRO	4	$150.00	$0.003
9	NO SALVAGING	EA/PRO	4	$70.00	$0.001
10	KIDS STAY IN CAR	EA/PRO	4	$150.00	$0.003
* ROADS					
	CONSTRUCTION				
1	ROAD ROCK	TONS/Y	100	$9.00	$0.090
2	ROLLER	DAYS/Y	1	$300.00	$0.030
3	BLADE	HRS/YR	8	$27.81	$0.022
4	WATER TRUCK	HRS/YR	8	$8.07	$0.006
5	GRADE SETTER/SURVEY	HRS/YR	16	$16.00	$0.026
	MAINTENANCE				
6	ROAD ROCK	TONS/Y	25	$9.00	$0.023
7	ROLLER	DAYS/Y	1	$300.00	$0.030
8	BLADE	HRS/YR	20	$27.81	$0.056
9	WATER TRUCK	HRS/YR	20	$8.07	$0.016
10	GRADE SETTER/SURVEY	HRS/YR	0	$16.00	$0.000
* PADS					
	CONSTRUCTION				
1	ROAD ROCK	TONS/Y	100	$9.00	$0.090
2	ROLLER	DAYS/Y	1	$300.00	$0.030
3	BLADE	HRS/YR	24	$27.81	$0.067
4	WATER TRUCK	HRS/YR	16	$8.07	$0.013
5	GRADE SETTER/SURVEY	HRS/YR	20	$16.00	$0.032
	MAINTENANCE				$0.000

ITEM NO	DESCRIPTION	UNITS	QUANTITY	$/UNIT	COST/TON
6	PAD ROCK	TONS/Y	100	$9.00	$0.090
7	ROLLER	DAYS/Y	1	$300.00	$0.030
8	BLADE	HRS/YR	8	$27.81	$0.022
9	WATER TRUCK	HRS/YR	8	$8.07	$0.006
10	GRADE SETTER/SURVEY	HRS/YR	8	$16.00	$0.013
* LEACHATE MANAGEMENT					
1	MONITORING (PHASE I)	EA/YR	12	$300.00	$0.360
2	MONITORING (PHASE II)	EA/YR	0	$3,500.00	$0.000
3	PUMPING & SPRAYING	GAL/YR	50,000	$0.02	$0.100
4	SUMP MAINTENANCE	EA/YR	2	$200.00	$0.040
5	SPRINKLER PIPE	FT/YR	40	$2.50	$0.010
* METHANE CONTROL SYSTEM					
1	MONITORING	EA/YR	4	$300.00	$0.120
2	VENT INSTALLATION	EA/YR	2	$500.00	$0.100
3	VENT MAINT/REPAIR	EA/YR	0.5	$200.00	$0.010
4	HEADER INSTALLATION	FT/YR	0	N/A	$0.000
5	HEADER REPAIR/MAINT.	EA/YR	0	N/A	$0.000
	CONDENSATE				
6	MONITORING	EA/YR	0	N/A	$0.000
7	HANDLING	GAL/YR	0	N/A	$0.000
* LANDFILL EXPANSION (based on 1 acre/year)					
1	ENGINEERING/SURVEY	EA/YR	1	$10,000.00	$1.000
2	EXCAVATION	YD/YR	INCL	$0.00	$0.000
3	ACCESS	SQ.FT/Y	INCL	$0.00	$0.000
4	LINER	SQ.FT/Y	50,000	$0.94	$4.700

ITEM NO	DESCRIPTION	UNITS	QUANTITY	$/UNIT	COST/TON
5	LEACH COLLECT. SYSTE	SQ.FT/Y	25,000	$0.62	$1.550
6	SOILS TESTING	EA/YR	1	$8,000.00	$0.800
7	GEOGRID	SQ.FT/Y	0	$2.40	$0.000
* ENTRANCE FACILITY					
	ROAD MAINTENANCE	SQ.FT/Y	1000	$0.05	$0.005
	FENCE MAINTENANCE	L.F./YR	400	$0.25	$0.010
	NEW CONSTRUCTION	EA/YR	1	$2,000.00	$0.200
* HAND TOOLS:					
1	SHOVEL (ROUND/SQUAR	EA/YR	2	$16.00	$0.003
2	BROOM	EA/YR	2	$10.00	$0.002
3	PICK	EA/YR	1	$17.00	$0.002
4	PITCH FORK	EA/YR	1	$20.00	$0.002
5	MECH TOOL KIT	EA/YR	1	$150.00	$0.015
6	SAW	EA/YR	1	$22.00	$0.002
7	ROPE	FT/YR	200	$0.18	$0.004
8	WIRE	ROLLS/Y	10	$3.00	$0.003
9	BOLT CUTTERS	EA/YR	0.5	$56.00	$0.003
10	FLASHLIGHT	EA/YR	2	$30.00	$0.006
11	HAND LEVEL	EA/YR	1	$55.00	$0.006
12	100' TAPE	EA/YR	0.5	$120.00	$0.006
13	HAMMERS (SLEDGE/CLA	EA/YR	1	$36.00	$0.004
14	HYDRAULIC JACK	EA/YR	0.5	$87.00	$0.004
15	HI-LIFT JACK	EA/YR	0.5	$48.00	$0.002
16	TOW CHAIN	EA/YR	2	$60.00	$0.012
17	GRADE ROD	EA/PRO	2	$200.00	$0.002
18	WEED TRIMMER	EA/PRO	4	$400.00	$0.008
19	BACKPACK SPRAYER	EA/PRO	4	$120.00	$0.002

ITEM NO	DESCRIPTION	UNITS	QUANTITY	$/UNIT	COST/TON
20	GAS/DEISEL CAN	EA/YR	2	$35.00	$0.007
ANNUAL OPERATION FEE (TO STATE):		EA/YR	10,000	$0.00	$0.000
		TOTAL COST:		/TON	$42.938
				/MONTH	$35,781.88
				/YEAR	$429,382.50

COMPOSITE LINER OPTION

PRE-DEVELOPMENT

1.	Land (100 acres @ $450/acre)	0
2.	Engineering	60,000
	Soils Testing	10,000
	Hydrogeological Assessment	40,000
3.	Legal Fees	4,000
4.	Licensing / Permits	0
	State Fees	0
	Application Fee	0
	Local Fees	0
5.	In-House Staff Time	0
	PRE-DEVELOPMENT COST TOTAL:	114,000

EQUIVALENT COST PER TON: $1.16/TON

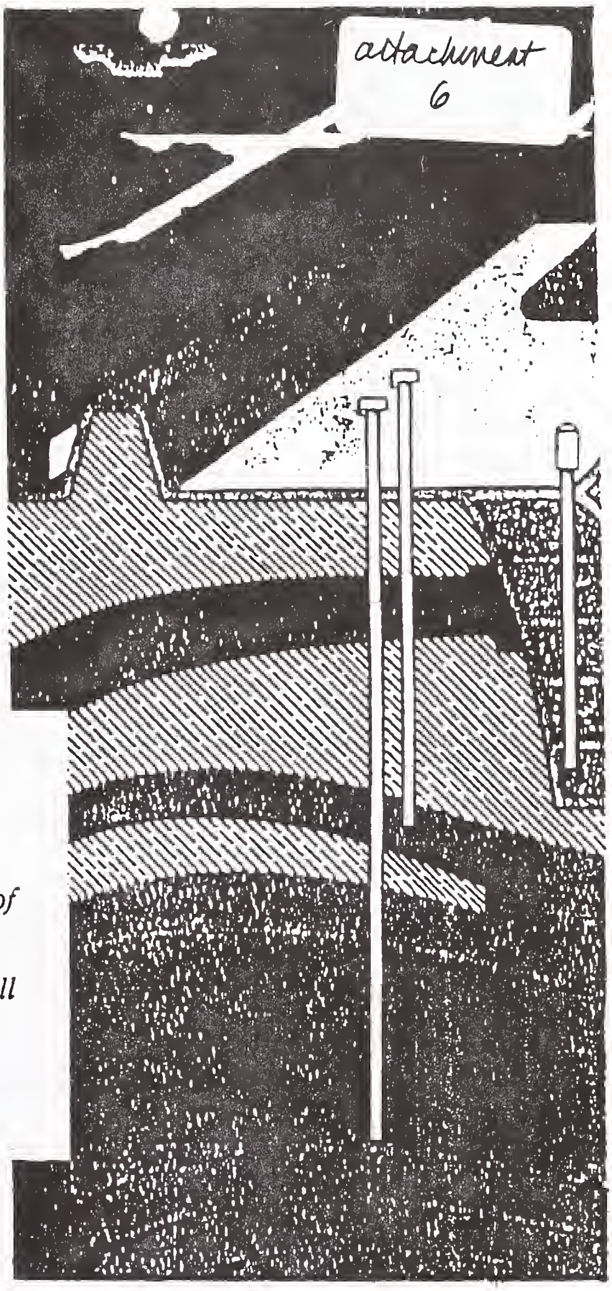
PROJECT:		
	CLAY LINER OPTION	
DATE:	MAY, 1993	
COVER RATIO:	2	:1 RATIO
DENSITY:	1100	LB/YD
SITE CAPACITY	545,455	YARDS
LANDFILL LIFE:	20.0	YRS

TONS/DAY:	38	(@ 260 DAYS/YR)
TONS/WEEK:	192	
TONS/MONTH:	833	
TONS/YEAR:	10,000	
TONS/PROJEC	200,000	

LABORER/ATTENDANT	$9.24	($7.00 + 32%)
EQUIPMENT OPERATOR	$14.52	($11.00 + 32%)
MECHANIC	$14.52	($11.00 + 32%)
SITE MANAGER	$14.52	($11.00 + 32%)
SURVEY CREW	$50.00	ESTIMATED
GRADE SETTER	$16.00	ESTIMATED

815 DIRT COMPACTOR	$27.81	CATERPILLAR + 3%
950 LOADER	$33.99	CATERPILLAR + 3%
120G MOTOR GRADER	$27.81	CATERPILLAR + 3%
816 COMPACTOR	$40.34	CATERPILLAR + 3%
627 SCRAPER	$65.92	CATERPILLAR + 3%
D6C DOZER	36.05	CATERPILLAR + 3%
WATER TRUCK	$8.07	ESTIMATED
MECHANIC'S TRUCK	$14.37	ESTIMATED
SITE PICKUP	$4.40	ESTIMATED

Subtitle D: How Will it Affect Landfills?



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THE PUBLICATION OF SUBTITLE D REGULATIONS in August 1988 will affect landfill costs across the U.S. How deeply costs are affected will depend on how states revise their regulations and implement the basic Subtitle D concepts. This article compares landfill costs of 1975 with those of today, and projects likely costs for a 1990 Subtitle D sample site.

Even without Subtitle D, landfill costs were rising dramatically. One reason is that absolutely everything involved in landfill design is more complicated and requires more money than anticipated. For example, simply finding and studying a site the public will accept technically, environmentally, and politically takes substantial time and money. Increased public awareness, and demands for compensation and more environmental control also have increased costs. Time delays in siting require that more money be spent. And now, state and local governments require special assessment fees for recycling, environmental repair of old sites, groundwater protection, etc., which are normally collected by the landfill.

This expert projects the cost of operating a Subtitle D landfill in the 1990s.

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Strict regulations, like Subtitle D, increase requirements for environmental controls and long-term care, and place more comprehensive, and thus costly, requirements on landfill operators.

BY ROBERT T. GLEBS, P. E.

Glebs is president of Creative Resource Ventures, Ltd., a landfill development firm.

State of the Art Landfill under Subtitle D

Subtitle D established national criteria for municipal solid waste landfills (MSWLF's). Different requirements are outlined for other non-hazardous wastes, but the discussion in this article will be limited to general new or

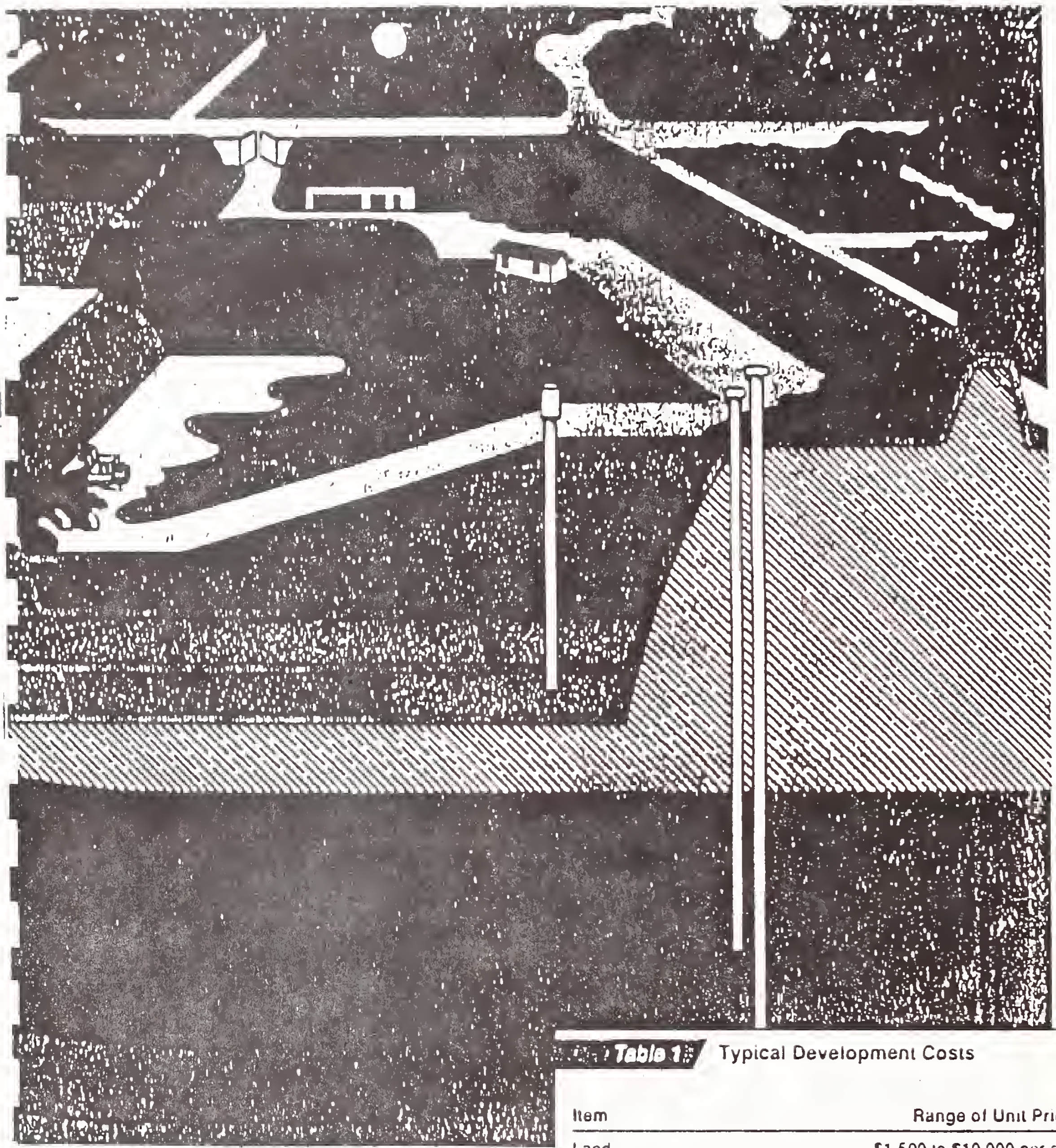

Table 1 Typical Development Costs

Item	Range of Unit Prices
Land	$1,500 to $10,000 per acre
Engineering	$100,000 to $800,000
Legal fees	$5,000 to $100,000
Licensing and permit review fees	$5,000 to $50,000

expanded municipal solid waste landfills.

Subtitle D is more restrictive now than ever before on locations that cannot be used for MSWLF's, making it more difficult, and costly, to find suitable sites. Specifically, Subtitle D's basic design, closure, and long-term care requirements demand more and better environmental controls, which will increase real costs for new or expanded landfills.

A Subtitle D state of the art landfill will likely have: one or two liners; leachate collection systems; final cover systems; more inspections and record keeping; more control of vectors; methane gas control; more detailed surface water run-on and run-off controls; more restrictions on wastes that can be received; a detailed

Table 2 Typical Landfill Development Costs

Item	Range of Unit Prices
Site Access Construction	
Gravel access road	$12.00-$16.00 per linear foot
Bituminous access road	$22.00-$24.00 per linear foot
Earthwork Construction	
Clearing & grubbing	$1,500-$3,000 per acre
Topsoil excavation & placement	
topsoil excavating & stockpiling	$1.05-$1.40 per cubic yard
topsoil excavating & placement	$1.80-$2.50 per cubic yard
Base area preparation	
Subsoil excavating & stockpiling	$1.10-$2.00 per cubic yard
Subsoil excavating & placement	$1.35-$3.00 per cubic yard
On-site clay haul & placement	$2.40-$4.00 per cubic yard
Sand blanket placement	$8.80-$12.00 per cubic yard
Flexible membrane liner	$7.20-$10.00 per square yard
Seed, fertilizer, & mulch	$1,000-$1,500 per acre
Leachate Collection/Transfer System	
Collection system piping	$17.50-$22.00 per linear foot
Cleanouts	$1,400-$1,500 each
Drainage System Control Devices	
Flat-bottom ditch construction	$1.00-$2.50 per linear foot
Underdrain system	
drainage pipe	$17.50-$25.00 per linear foot
select granular fill	$8.80-$12.00 per cubic yard
Gas migration control	$5,000-$10,000 lump sum
Administration, construction, & other miscellaneous costs	$150,000-$300,000 lump sum
Miscellaneous	
Facility sign and gate	$2,000-$3,000 lump sum
Scale house equipment shed	$66,000-$80,000 lump sum
Facility fencing	$10,000-$15,000 per linear foot
Truck scale	$36,000-$40,000 each
Other miscellaneous site upgrading	$10,000-$15,000 lump sum
Gas Venting System Installation	
Blower assembly	$93,000-$150,000 lump sum
Gas extraction wells	$7,300-$10,000 each

closure plan and funding to cover closure; financial assurance required upfront or as part of operations, thus increasing gate fees; and groundwater monitoring and corrective actions which may include monitoring systems, sampling and analysis programs, contingency plans with trigger levels, and contingency action plans.

Sounds tough? These requirements are common for new sites and may also be applied retroactively to upgrade existing sites.

Complying with the new requirements will be expensive. The increase in landfill development costs can be a burden in the short-term (up-front liner and leachate system installation), as well as in the long-term (monitoring throughout the landfill's operating life and thereafter).

Good financial planning is now a necessity in the landfill business. To account for the increases in design and operations, gate fees at landfills must be increased. Landfill costs can be expected to rise in the areas of pre-development, construction, operations, closure, post-closure, and unanticipated costs.

Pre-development costs

Pre-development costs include site selection, investigation, and permitting costs. Table 1 presents typical predevelopment costs.

These costs will vary widely, depending on the market value of land, the complexity of the state regulations, and the level of service or assistance needed from outside engineers or permitting agencies.

Land costs relate directly to local economics, pre-development land use, and the land's proximity to urban areas. Historically, as public objections to landfills rose, landfills tended to be sited further from city limits; in many instances, this resulted in lower land prices. However, as fuel prices rose, transportation costs increased, and the price of land took on less importance. The desire to be closer to waste generation sources and leachate disposal systems has influenced developers to deal with local objections and to site facilities closer to urban service areas. This typically results in higher land prices. Subtitle D will make the task of finding suitable sites more difficult.

Increased regulatory activity has also influenced landfill design requirements. The process of obtaining permits is changing. In the past, most state regulatory agencies required a single technical submission. Today, the permitting process in many states requires multiple submissions; the process can take two to five years. These multiple submissions and the lengthy licensing time frame have increased engineering costs and legal fees.

Typical costs associated with land prices, engineering and legal costs, permitting fees, and ancillary development costs, will vary widely. Generally, pre-development costs represent less than 10% of total site development costs for a state of the art non-hazardous landfill.

Construction costs

Costs associated with site construction directly relate to the complexity of site design. There are many factors affecting the costs of site construction.

Most important is the type of liner design used (clay liner, synthetic liner, no liner, etc.). The cost of developing a new clay-lined landfill includes the following items: general excavation; liner construction; leachate collection and extraction system design; surface water drain-

Table 3 Site Operations

Item	Range of Unit Prices
Operation costs for a 600-750 tpd site, including men, machines, facilities, & maintenance	$600,000-$750,000 per year
Leachate collection & treatment	
By truck: 10 mile haul	$0.02-$0.03 per gallon $65,700-$219,000 per year
By sewer: sewer charge	$0.01-$0.03 per gallon $21,900-$65,700 per year
Environmental monitoring	$8,000-$40,000 per year
Gas management and control operations	$10,000-$30,000 per year
On-going engineering, staff time, etc.	$0.00-$20,000 per year

Assume: a 40-acre site with an efficient liner and collection system with good drainage, a typical generation rate of 6,000-10,000 gpd during operations and 10,000 after closure.

Table 4 Typical Closure Costs

Item	Range of Unit Prices
Final cover	$2.50 - $5.00 per cubic yard
Topsoil	$1.20 - $2.50 per cubic yard
Seed, fertilizer & mulch	$1.05 - $2.00 per acre
Gas control (passive trench*)	$4.00 - $6.00 per linear foot

* **Assumption:** the blower assemblies and network will be in place and that those costs were part of site construction.

Source: Creative Resource Ventures, Ltd

Table 5 Typical Post-closure Costs

Item	Range of Unit Prices
Annual inspections	$1,000 - $9,000 per year
Land surface care	$500 - $1,000 per year
Leachate hauling & treatment (10,000 gallons/day, sewer discharge costs of $0.01 per gallon):	$36,000 per year
Environmental monitoring	$8,000 - $40,000 per quarter
Gas:	$10 per point
Groundwater:	$250 - $500 per sample location
Leachate:	$500 - $2,000 per sample
Gas Control	$10,000 - $30,000 per year

Source: Creative Resource Ventures, Ltd

age controls; and other facilities such as scale and maintenance buildings, access roads, and fencing.

Table 2 presents typical construction unit prices for sites constructed in 1988. The unit price information presented is for sites constructed in the upper-Midwest.

Typically, the most expensive items in site construction are the liner and leachate collection system. For example, placing a five-foot clay liner with six-inch leachate collection pipes and a one-foot sand blanket in an already excavated, prepared hole, assuming clay was already on-site, would run $40,000 to $50,000 per acre, not including leachate storage tanks, external piping, and manholes.

If clay needs to be hauled on-site, the cost could easily double or triple to $80,000 or even $130,000 per acre because of transportation costs.

Similarly, the cost of a single synthetic liner including six-inch leachate collection pipes and a one-foot sand blanket could range from $60,000 to $100,000 per acre, including extra sub-grade preparation and sand bedding for liner placement. Again, this does not include leachate storage tanks, external piping, etc.

Some local factors that may affect unit prices in Table 2 include: haul distances for off-site materials; local economic conditions; contractor experience; time of year, both for bidding and construction, relating to construction calendars and season; and other factors such as clarity of plans, specs, contracts, etc.

Construction costs typically represent 15% to 25% of total site development costs. These costs include initial site preparation and subsequent site construction not performed as part of operations.

Operating costs

Operating costs represent the greatest cost for site development. They include manpower, equipment, maintenance, utilities, administration costs, and fuel.

In a state of the art Subtitle D landfill, however, items such as leachate collection, transport and treatment, leachate collection system maintenance, environmental monitoring (gas, leachate, air, and water), and gas management and control must be added.

Table 3 details typical operating costs. A review of the table points out that the state of the art landfill can add significant costs to operations for leachate handling. A site generating 10,000 gallons of leachate per day at one cent to six cents per gallon, can add as much as $219,000 in handling charges per year to operational costs. And these costs assume sewering of leachate will continue as an acceptable means of treatment. However, certain states and municipalities may require pre-treatment, which could easily add 10 cents per gallon to costs, depending on the level of treatment needed.

One further item; the cost of hauling leachate by transport versus direct sewer discharge is significant. As a result of this cost difference, many site developers consider siting facilities closer to existing sewer lines.

Table 6 Example of State Surcharges

State	Item/Fee	Status/Amount
Pennsylvania	Resource Recovery Fee	proposed/$1.50 per ton
Wisconsin	Environmental Repair Fund	in force/$0.15 per ton proposed/$1.00 per ton
	Groundwater Fund	in force/$0.10 per ton
	Waste Management Fund	in force/$.015-.035 per ton proposed/$1.00 per ton
	Resource Recovery Fee	proposed/$2.00 per ton
Illinois	Recycling Grant Fee	in force/$0.95 per ton
New Jersey	Sanitary Landfill Facility	in force/$0.50-$1.05 per ton
Colorado	Hazardous Waste Fees	proposed/$0.15 per ton
Ohio	County Plan Fund	proposed/$0.40-$0.80 per ton

Table 7 Generic Landfill Development Cost Estimate

Item	Total Cost	Cost/Ton % of Total
Predevelopment		
Land costs	$1,000,000	$0.35/1.81
Engineering costs	$1,490,000	$0.52/2.71
Licensing costs	$42,000	$0.01/0.08
Miscellaneous development costs	$253,000	$0.09/0.46
Subtotal	$2,785,000	$0.97/5.06
Site Preparation and Construction Costs		
Phase I	$2,725,000	$0.95/4.94
Phase II	$2,001,000	$0.70/3.64
Phase III	$2,001,000	$0.70/3.64
Phase IV	$2,001,000	$0.70/3.64
Subtotal	$8,728,000	$3.05/15.86
Site Operating Costs		
Site operation	$16,620,000	$5.81/30.20
Leachate hauling & treatment	$ 2,520,000	$0.88/4.58
Environmental monitoring		
On-going engr. asst., admin., and other misc.	$ 1,640,000	$0.57/2.98
Interest on capital debt	$ 4,000,000	$1.40/7.26
Subtotal	$24,780,000	$7.27/45.02
Site Closure		
Phase I	$ 762,000	$0.27/1.38
Phase II	$ 625,000	$0.22/1.13
Phase III	$ 544,000	$0.19/0.99
Phase IV	$ 544,000	$0.19/0.99
Subtotal	$ 2,475,000	$0.87/4.49
Post-Closure care costs		
Environmental monitoring	$ 1,500,000	$0.52/2.73
Leachate hauling & treatment	$ 6,480,000	$2.27/11.77
Land surface care, site inspection, admin., and other misc. costs	$ 1,140,000	$0.40/2.07
Subtotal	$ 9,120,000	$3.19/16.57
Other		
Fees	$ 2,860,000	$1.00/5.20
Incentives	$ 4,290,000	$1.50/7.80
Subtotal	$ 7,150,000	$2.50/13.00
PROJECT TOTAL	$55,038,000	$19.25/100.00

Table 3 shows that the costs for hauling leachate on a 20-mile round trip can add as much as three cents per gallon to costs.

Environmental monitoring is an additional operational cost, which may include groundwater monitoring, leachate monitoring, gas and air monitoring, and surface water monitoring. Environmental monitoring costs are highly variable. At a given site, the figure is directly related to the number of monitoring points, the frequency of monitoring, and the number of parameters. A rule of thumb for groundwater monitoring costs is $250 to $500 per well per sampling. That may not sound like much, but consider that a well is monitored quarterly for 15 years of operation. At the upper-range, the cost for one well would be $30,000 during the site's life.

With Subtitle D requiring gas management at all new and expanding sites, costs will increase further. Gas migration control with an active gas system will add $10,000 to $30,000 per year to site operations costs. Site operations costs typically account for 40% to 50% of development costs; therefore operational costs can have the greatest impact on reducing overall development costs.

Closure costs

Site closure is the lowest overall cost associated with site development. In fact, depending on site characteristics such as available cover soils, and the amount of available equipment, a major portion of this cost will be incurred as an operational cost.

At many sites today, final capping is performed by landfill personnel as the site reaches final grade, as opposed to contracting for these services. Where this work is contracted, unit prices as shown in Table 4 can be affected by the same factors affecting site construction costs. Table 4 presents costs for typical closure work.

Depending on how much of this work was performed during operations, site closure will range from 3% to 5% of site development costs.

Post-closure care

With the publication of Subtitle D, EPA clearly intends to require extensive post-closure care for 30 years, and leaves it to the states to require additional post-closure care if they desire.

State regulations used to drive this category. In some states, site owners are relieved of the responsibility for long-term site care 20 to 30 years after site closure. Now, post-closure periods will be 30 years or more.

Table 5 presents post-closure care cost estimates. These costs can represent 10% to 20% of site development costs, and possibly more.

Subtitle D requires site owners to provide financial assurance for long-term care during site operation. Significant portions of these monies are required up front when opening the site. This can impact future planning significantly.

Unanticipated Costs

Unanticipated costs are cost items not directly related to the cost of burying wastes, but more or less a part of landfill development now and in years to come. First, for instance, in most states, there are or will be assessments for funding recycling, groundwater, protection projects, environmental repair of old sites, or new state programs. These state assessments are normally mandated by the law that allows the state to collect a certain fee per ton or yard of waste accepted at the landfill gate. Some examples of state assessments are shown in Table 6. A recent court victory was won by waste industry interests in Illinois against an assessment whose proceeds went to a state fund that would have subsidized recycling projects.

Local incentives are a second surprise cost category. These costs help upgrade local roads, protect or guarantee property values, replace local private wells, and provide better screening. They usually are negotiated with local host municipalities under legal requirements or provided as trade-offs to get permits.

Local incentive costs can include free or cut-rate disposal for the host municipality, or money to off-set disposal costs for the local municipalities, a straight payment to the local municipalities on a per-ton or per-yard basis. This cost can range up to $1.50 per ton or more, depending on local negotiations, politics, etc.

These two surprises can add significantly to the bottom-line costs of landfilling. They could increase costs to landfill by 5% to 15%.

State of the art landfill costs: an example

To illustrate today's costs of landfill development, this section estimates the costs of developing a site located in an upper-Midwestern state in 1988 that will meet Subtitle D requirements. Costs presented in Table 7 are estimates based on Phase I construction, and are presented in 1988 dollars. Operations costs represent first-year costs.

Table 8 Landfill Development Costs Past, Present, and Future

Typical 1975 Landfill Development

Cost Item	$/ton	%
Predevelopment costs	$0.25	5.9%
Construction costs	$0.52	12.3%
Operations costs	$3.20	75.7%
Closure costs	$0.26	6.1%
Post-closure care costs	$0.00	0.0%
Unanticipated costs	$0.00	0.0%
Subtotal	$4.23	100%
Profit (10-25)	$0.42-$0.85	—
Total (including profit)	$4.65-$5.08	—

Typical 1988 Landfill Development

Cost Item	$/ton	%
Predevelopment costs	$0.42-$1.30	3-6%
Construction costs	$2.60-$4.90	15-25%
Operations costs	$4.50-$8.50	30-40%
Closure costs	$0.50-$1.00	3-5%
Post-closure care costs	$2.00-$4.00	10-20%
Unanticipated costs	$1.00-$2.50	5-15%
Subtotal	$11.02-$22.20	100%
Profit (10-25)	$1.00-$5.50	—
Total (including profit)	$12.02-$27.70	—

Typical 1990 Landfill Development

Cost Item	$/ton	%
Predevelopment costs	$1.50	7.3%
Construction costs	$5.00	24.4%
Operations costs	$8.00	39.0%
Closure costs	$1.00	4.8%
Post-closure care costs	$3.00	14.7%
Unanticipated costs	$2.00	9.8%
Subtotal	$20.50	100%
Profit (10-25)	$2.05-$5.12	—
Total (including profit)	$22.55-$25.62	—

Predevelopment costs will include: 1,000 ton per day municipal solid waste facility; 4:1 cover to waste ratio; 10-year site life; 5.5-day work-week; 60-foot average depth of fill; buffer area for screening and on-site borrow; phased development in four equal phases (18.5 acres each); phases are closed as new phases are developed; estimated site selection and initial feasibility report costs; estimated licensing and regulatory review fees; and administration, contingency, and miscellaneous cost factors.

Site preparation costs will include: 3-foot clay liner using on-site materials; 1-foot sand blanket using off-site materials; 6-inch PVC collection pipe in the

Table 9 Cost Components/Breakdowns for Various Items

Groundwater Monitoring:

	10 wells	30 wells
installation	$15,000 —	$300,000
monitoring	$600,000 —	$2,600,000
Total	$615,000 —	$2,900,000

Gas Control/Monitoring:

$500 per internal wall vent (every 200 feet)
$500 to $1,500 per monitoring point installed
$10 to $100 per sample per point

	low case	high case
installation	$17,500 —	$28,000
monitoring	$14,000 —	$45,000
gas control	$50,000 —	$500,000

Total $81,500 - $573,500
Assume: internal wall vent every 200 feet; $10.00-$100.00 per sample point; $10,000-$30,000 for operation and maintenance.

Liner & leachate Collection Costs

Clay	$2.40-$4.00 per cubic yard
Sand	$8.00-$12.00 per cubic yard
Synthetic (flexible membrane) liner	$0.80-$1.20 per sq. ft. installed
Lysimeters	
50 x 100:	$5,000-$7,000
Pipe (6" PVC)	$15.00-$20.00 per linear foot
Lift station	$20,000-$40,000
Manhole	$1,500-$8,000
10,000 gal. tank	$20,000-$40,000 each (double wall)
Total	
40-acre site, 5-foot clay liner, 2 lysimeters. $40,000 to $60,000 per acre	$2,200,000
40-acre site, synthetic liner. $60,000 to $100,000 per acre	$3,500,000

Leachate Transport & Treatment

10-mile haul	$0.02-$0.03 per gallon
Treatment	$0.01-$0.03 per gallon
10,000 gallons per day	$65,700 to $219,000 per year
Over 40 years	$2,628,500-$8,760,000 over site life

Assume: 40-acre site, humid environment & efficient collection.

Run-on/Run-off (Surface Water) Controls

Ditching	$0.05- $1.70 per linear foot
Sedimentation basin	$1,000-$20,000 per unit
Monitoring	$100 to $500 per point
Total	
Construction	$36,000
Monitoring	$40,000
	$64,000

Assume: 40-acre site, two basins, perimeter ditch, quarterly monitoring over 45 years.

Closure Costs

Final cover	$2.50-$5.00 per cubic yard
Gas system	(already covered)
Topsoil	$1.20-2.50 per cubic yard
Seed, etc.	$1,000-$2,000 per acre
Leachate wells	$5,000-$10,000 each
Documentation	$10,000-$20,000
Total	$500,000

Assume: 40-acre site, two feet of final cover clay, two wells, four phases.

Post closure care costs

Annual inspections	$1,000-$9,000 per year
Land surface care	$500-$1,000 per year
Leachate transport & treatment	$65,700-$219,000 per year
Monitoring	$8,000-$40,000 per year
Leachate system maintenance	$1,000 to $3,000 per year
Total Per year	$76,000-$272,000
Over 30 years	$2,280,000-$8,160,000

Assume: 40-acre site, leachate collection, 2.5 feet of final cover, 30 years of long-term care.

leachate collection system; collection pipe placed at 200 feet on center; 10-foot excavation assumed; active gas collection and flaring system; bituminous entrance road and gravel on-site roads; and estimated surface drainage system.

Site operating costs will include: adequate material available on-site for daily cover; and off-site treatment of leachate.

Site closure costs will include: 3-foot clay cap; 3-foot protective cover and topsoil layer; and adequate available material on-site for the cap and protective cover layer.

Post-closure care costs will include: 30-year post-closure care period; and maintenance of environmental monitoring systems and leachate collection system.

As seen in Table 7, construction costs for Phases Two, Three, and Four are substantially less than for Phase One. The first phase includes initial access road and building construction, and reflects the costs of excavating large quantities of soil to reach base grades. Operational costs reflect significant dollars for base operations but also for leachate, monitoring, and interest on debt to develop and construct the site.

Note how significant a portion of total costs the post-closure costs and other fees are becoming. When you start to pay local incentives on a per ton basis or state fees, and you have to care for a site for 30 years after closure, costs will increase remarkably.

A look at the future

In the past, the distribution of costs for the six major areas of landfill development was substantially different from present landfill development practices. Table 8 shows how site development costs have changed over time and may change in the future; Table 9 breaks down cost components, and offers an interesting look at some key costs.

The majority of facility costs (nearly 80%) were previously for site operations. This left only 20% for the other five areas. In the past, no money was allotted for long-term care or unanticipated costs. Note, too, that all costs presented do not yet include profit or site replacement costs (i.e., the cost of acquiring and developing the site that will be needed once the current landfill is closed). For private developers, profit must be based on a fair return on investment and compensation for the money at risk. In setting a fair profit, an owner must also consider competition. In the public sector, landfill replacement costs may be considered in lieu of profit.

In general, profit or replacement costs may add 10% to 20% or even more to site development costs, depending on the specific conditions of each location.

For today's landfill, excluding profit, site operations still represent almost half of costs (40% to 50%). However, site construction of a state of the art landfill is costly (15% to 25% of overall costs), because of new design and operating requirements. Long-term care costs also are significant. Landfill development costs now include money for post-closure care, compared to 0% in the past. And surprise costs are real.

In the future, which Table 8 projects, it is likely costs will not rise dramatically over 1988 costs. Costs will likely stabilize as we become more experienced with sophisticated construction. In some states, costs already reflect Subtitle D regulations. The costs for landfilling are beginning to or will level out around $20.00 to $25.00 per ton. The price for disposal on the other hand will vary with market conditions. ■

Attachment
7

PIPER JAFFRAY

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NEW HELENA, MONTANA MUNICIPAL BOND ISSUE

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John T. Wolff
Managing Director

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Attorneys at Law

Power Block Bldg., Suite 300
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P.O. Box 1185
Helena, Montana 59624
(406) 443-7018
Fax: (406) 449-8443

attachment 8

April 28, 1993

HAND DELIVERED

Mr. Bob Johnson, Director
Lewis and Clark County Department of
Health
City County Building
316 No. Park
Helena, MT 59623

Re: Site E Costs

Dear Bob:

This letter, which follows up my previous request of April 7, 1993 for Site E costs (copy attached), will confirm that on Thursday, April 22, 1993, you advised me that no such cost summary was yet available and that you would provide me with all these costs after you had a chance to confer with Mr. Damschen during the week of April 26, 1993.

I look forward to hearing from you once you have a chance to put together a detailed compilation of all Site E costs.

Thank you.

Sincerely,

Frank C. Crowley

Frank C. Crowley

cc: County Commissioners
Ted Hill

Specializing in water, natural resource & environmental law, and government relations
*Also admitted in Maine & Massachusetts **Also admitted in the District of Columbia ***Also admitted in California (inactive)

attachment
9

- Other alternatives described above would be mentioned and briefly described in Chapter Two of the EIS, and eliminated based on best justification. Other alternatives mentioned by the public in scoping, such as a specific waste-to-energy process proposed by T. Morrison, would likely be dismissed with the same analysis.

- More site-specific data are required in order to provide a comparable evaluation of Site A or Site B in the EIS. More site-specific data may be required for the Tenneson Site in order to provide a comparable evaluation in the EIS, but because this site is permitted it is likely to have at least as much baseline information as other sites being considered. Additional information concerning such issues as transportation requirements (for instance, traffic counts on York Road, realignment of the Warren School curve, etc.) are assumed to be available at the appropriate County offices.

  At the request of Mr. Jon Dilliard, we have prepared an estimate of costs required to obtain the hydrogeologic data required for sites A and B. We estimate it would cost approximately $4,000.00 to drill and complete each monitoring well required in the Helena valley. This estimate assumes a 100-ft well with 2-inch diameter, PVC casing. Supervision and well logging time is included. Sampling costs are not included in the estimate. Therefore, installation of five wells (two at Site B and three at Site A) would cost approximately $20,000.00 to $25,000.00.

- Collection of additional data would delay development of the EIS and increase the level of effort required to prepare the affected environment and assess impacts. We suggest a meeting in the near future to discuss site data needs should DHES direct us to conduct a full evaluation of impacts associated with Site A, Site B, and/or the Tenneson Facility.

- It is at present unclear what regulatory criteria will be applied in evaluating these alternatives. The State has not yet adopted rules implementing the new Subtitle D requirements. For example, should a proposed landfill be evaluated for impacts based on a worst-case design, such as a composite liner? Or alternatively, should the evaluation rely on existing rules with an assumption that the facility would be constructed and operating prior to October, 1993?

- Further, even though MEPA rules are silent on this issue, your Counsel may wish to consider NEPA CEQ rules at 40 CFR §1502.2(f) regarding committment of resources to Site E in advance of the permit decision.

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JUN 0 4 1993

MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID AND HAZARDOUS WASTE BUREAU

May 17, 1993

Manager, Solid Waste Program
MDHES, 836 Front Street
Helena, MT 59620

Dear Mr. Jon Dilliard,

This EIS is not complete in at least two different ways that I found. For example there is much said in the document about the drainages in the Helena Valley: Prickly Pear, Ten-Mile, and Silver Creeks. As well as the Helena Valley Aquifer. If these were affected by Site E there would be much bigger problems closer to the site. There is much said in the document of the affects to the west, but there is not much information presented regarding impacts to the east. H-1

One impact missing is the potential contamination of Cedar Creek. This little creek is not included on any of the maps in the document. This little creek is fed by springs located down gradient from Site E and flows directly into Hauser Lake (i.e. Missouri River) approximately 1/4 mile south of Lakeside Marina. If one of those springs feeding the creek is contaminated Hauser Lake will be directly affected. The EIS states that if ground water were contaminated down gradient wells would be impacted. But it ignores the springs being likewise impacted. The flow of the springs is described in the document at three different rates. First it is estimated by the experts at 10 gallons per minute. The document later quotes the residents as estimating the flow at 100 gallons per minute. While the document states this might represent a highly fluctuating water table, it goes on to say that during field surveys conducted in December 1992 and as recently as April 1993 (which is the date of the document) there was a "heavy discharge" from one or more of the springs. But it does not show any attempt to analyze the impacts of leachate contamination or what would be needed to prevent it. H-2

The Document attempts to wrap up the discussion of the springs with, "Assuming mitigation measures are taken, the quality of these sources should not be adversely impacted." It does not describe what these mitigation measures are, nor what exactly needs to be done to prevent the contamination of this stream. Nor does it itemize the associated monetary costs of the mitigation. H-3

I would like to add that while this little stream may be affected by irrigation activities it is not dependent upon them, as is suggested in the document. I have included several pictures showing water flowing from its springs in December 1992 and January 1993. (I also included a picture of a deer that resides near the springs.) H-4

The EIS is also incomplete in the area the costs. The summarized amounts found in chapter 4 are neither complete nor do they appear to have any basis. H-5

I am a Certified Information Systems Auditor (or Certified Computer Auditor). This basically means I am certified to audit from the outputted computerized summaries back through the computer to the source data that went into the summaries. None of the summaries in the document are itemized. So there is no breakdown to detailed costs rounded to the nearest dollar. This condition renders the report basically unauditable. H-6

Some of the estimates are basically meaningless. For example, the "Preliminary estimates for a gas collection system for a landfill similar in size to Lewis & Clark County's range from $200 thousand to $2 million." This results in a difference of $1.8 million which is really no estimate at all, more it is just a wild ball park guess. H-7

The annual landfill O & M (operation & maintenance) has a summarized total of $0.7 million to $1.2 million. There is a long shopping list of items composing the O & M but there are no individual costs associated with each of these items. H-8

If we had the detailed costs of all of the summaries rounded to the nearest dollar, we could determine the basis and the validity of your cost estimates. H-9

The summary section of the Draft EIS states that Site A was ranked highest and Sites B and E were ranked lowest. But a change of intentions of the adjacent landowners of Sites A & E caused a shift in boundaries. The final analysis ranked A highest when ratings for evaluation categories were combined. However Site E was chosen, "Apparently because of the low purchase price for a much greater acreage relative to Site A." H-10

According to information I have read, the County Commissioners only intend to open Phase I, or use about 1/3 of the total land purchased. Doesn't that defeat their reason for selecting Site E and return the best selection back to Site A? H-11

How does the purchase of "more land" make it the best choice for a landfill if that "more land" is not going to be developed as a landfill? H-12

Thank You,

Cleber A. Amundson, CISA
811 8th Avenue
Helena, MT 59601

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JUN 04 1993

MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID AND HAZARDOUS WASTE BUREAU

May 17, 1993

Manager, Solid Waste Program
MDHES, 836 Front Street
Helena, MT 59620

Dear Mr. Jon Dilliard,

The following are my comments regarding the deficiencies of the draft Environmental Impact Statement on the Lewis & Clark Landfill.

It is very distressing to me that during the scoping process, we, the public were advised that all of our concerns would be addressed. On page 5-1 the document states that it was not possible to address every issue or concern raised during the siting studies or the EIS scoping process. It appears to me that the public was deceived. I-1

Chapter 5, page 5-6 states that the Department does not find any one alternative disposal site to be significantly superior to any other alternative site or the proposed action. If the Department truly believes this, then the cost significantly differentiates this issue. Table 5.1-1, page 4 of 4 shows the capital costs of Site E to be 6.2 - 9.7 million dollars. It shows CCSS to be $170,500. This appears to be a great difference. If the Department considers all other things equal, does this not identify an issue which indicates superiority and fiscal responsibility? I-2

The third issue I wish to raise is the document's complete deficiency in even mentioning Cedar Creek in relation to Site E. This is a spring fed creek which runs year round and is less than a mile downhill from the site. This must be addressed. I-3

Thank you for your consideration of these issues.

Helen Amundson

Helen Amundson
811 8th Avenue
Helena, MT 59601

(This document was printed on recycled paper)

June 4,1993

DHES
Solid & Hazardous Waste Bureau
836 Front Street
Helena, MT 59601

Ladies and Gentlemen:

The following are my comments about the Lewis & Clark County landfill draft EIS.

First of all I want to thank you for extending the comment period. I really appreciated the additional time. J-1

While the EIS acknowledges the potential hazard of leachate contaminating groundwater it fails to evaluate alternative sites in light of hazards already existing. It also fails to weight the risks in light of our semi-arid climate and thevalue of the water quality that presently exists at alternative sites. The weight of this hazard must be based on the fact that a new landfill and some of the preexisting hazards will be there forever.Preexisting hazards include:

- ASARCO smelter
  - history of pollution back to 1888
  - Lamping land and water rights bought by ASARCO in out-of-court settlement over contamination.
  - history of settlements paid to area ranchers for crop and livestock damages
  - repeated violations of emission standards for lead and sulphur

*old City of East Helena landfill (unlined)
*East Helena sewage lagoons
*Eastgate sewage lagoons
*American Chemet Corp. plant
*CCSS unlined landfill

Risk of another leachate plume should be a major consideration and I do not think that the EIS adequately weighs this risk. J-2

Site E is located on a hydrologic divide and there is potential to contaminate not 1 but 2 watersheds. The EIS fails to acknowledge the irreversible and irretrievable commitment of 2 clean watersheds at Site E being traded for the permanent risk of contamination of two watersheds. J-3

Also Site E's close proximity to 3 major surface water bodies is another risk factor for greater damage J-4 in the event of a leak. And for wildlife impact. J-4

Discrepancies in the Chen-Northern Phase II Hydrological Report have been pointed out but you have dismissed them. In particular spring S-3 which Chen-Northern listed as 5-10 gpm I estimated at 100gpm during Dec. 1992. Ken Wallace himself estimated the flow at 50-60 gpm on 4-19-93. This is 1½ miles downslope from Site E. But then since you've indicated through Jim Wilbur's comments in the Independent Record tha you already know all you want to for "an acceptable monitoring system"so what, right? J-5

The EIS is inadequate on examination of the costs for each alternative. Now that the Scratchgravel Landfill District has prepared a budget and assessments based on operating a landfill at Site E the comparison should be easier to do and these new estimates must be examined in the EIS. J-6

There is a discrepancy in the cost figures shown in the Phase II siting study vs. the EIS: J-7

for O&M:	Phase II	EIS
Site E	430,000	420,000-825,000
Site A	417,000	420,000-825,000

The unequal change in these estimates is not explained.

Transportation has not been equitably or adequately analyzed in the EIS. No consideration is given to regional hauling impacts. It's long past time to take off the blinders. How many landfills do you foresee getting sited in our region? Budgets have already been presented to the city/county health board that include the prospect of solid waste from Broadwater and Jefferson counties. It's only reasonable for you to compare haul route impacts. Also we must consider other potential landfill users including East Helena, White Sulphur Springs, Lincoln, Wolf Creek and perhaps others. A network of haul routes to the landfill from several directions is the most likely scenario and therefore you must consider its impacts in the EIS. J-8

No comparison of transportation costs to local sites has been done yetand air quality impacts of hauling to different siteswithin our area have not been compared yet you sight these reasons in dismissing hauling out of our region. These impacts must be weighed equitably. J-9

Again I must tell you that I disagree with your conclusions about traffic impacts, particularly on York Road. IN the EIS it is described as "Some single family homes are found along the route." That description is J-10 laughable in its understatement. Many stretches of the route are, infact, lined with single family homes and each with its own driveway.You have failed to consider that much of the land along this route is not being productively utilized as part of a viable agricultural enterprise and that in all likelyhood its future use will be for further residential development. J-10

It's a narrow road by today's standardswith very narrow shoulders and steep banks and a poor bed. It's the only corridor serving several residential areas including Lakeside and York. In a climate where we have frequent warnings of "patchy valley fog" and road reports of "spring breakup" or "potential flooding of small streams" you must realize the risks are higher for these conditions on York Road than other haul routes. It's a poor choice for routing semi trucks. J-11

Sites E and A are not treated equitably in terms of acreages and landfill lifespan. Wayne Miller has made it clear that more acreage is available at Site A and acreage excluded by Jefferson County's zoning ordinance may now be available along the south side. These considerations must be taken into consideration. Site E's larger relative size, hence longer lifespan, made it appear to cost less in the siting studies. Yet you continue to weigh the impacts of only 80 acres of landfill at Site E. J-12

The EIS under rates the impacts of adding an industrial use to a residential/rural area now free of industrial use. You underestimate the value of residing in anindustrial-free area. I disagree with your conclusion that "Indirect effects to existing or planned uses in proximity to the site are expected to be low." Many landowners in that area are banking on being able to sell land for residential development. That is now themost economically viable alternative for many marginally productive parcels near site E. J-13

I disagree with your undocumented conclusion about Irreversible or Irretrievable Commitment of Resources regarding soil or geological resources. You dismiss the potential of minable uranium based solely on Becraft (1958) saying "the radioactive anomalies represent uranium concentrations much too low to warrant extraction." Substantiate this please. That conclusion is questionable in light of the fact that at least two major mining corporations with extensive experience in uranium exploration and mining, under the recommendation of their teams of geologists, came to the opposite conclusion and were confident enough to spend several million dollars on mineral leases and exploratory drilling and sampling in the area of Site E. J-14

Without attempting to examine their findings you cannot say you have fairly assessed this potential. And to simply say you don't think uranium mine potential exists is really not fair. J-14

In the EIS scoping process it was requested, and we were assured, that comments made during the EA process would be addressed. Several of my questions, which I still think may address reasonable concerns have yet to be answered:

How much radioactivity will be encountered in building a landfill at Site E?

If radioactive deposits are disturbed what effect will there be on groundwater? J-15

Will radioactive pollution be significant as blowing dust? as a hazard to landfill workers? as a contaminant on heavy machinery? as runoff from exposed uranium?

And would the applicants be in compliance with Montana's ban on radioactive waste?

You admit that strong odor and litter are two impacts butthe EIS lacks a comparison of these negative impacts based onprevailing winds and location and numbers of affected residents and other sensitive uses such as recreation . J-16

I am compelled to point out how the EIS appears to be biased and unsubstantiated in its description of public input. In at least three places you use the words "strong public opposition" in wording that implies justification for derating Site A. You do this repeatedly and without technical substantiation while failing to note the many meetings, hearings, and comments in the 3½ years since that have been attended by crowds overwhelmingly opposed to Site E. Reading your EIS one would never get a true picture of the public opposition. J-17 I do not think that strength of opposition at the siting study meetings is a valid criteria for siting a landfill and should not be mentioned as a "however" every time Site A is mentioned. It is also quite evident now that the measure of opposition was based more on WHO showed up than how many or the substantive merit of comments about impacts.

No reasonable justification for Site E's change in rank from lowest to highest has yet been presented but all the players have since fallen into line to defend its adequacy without showing its inferiority. J-18

Lastly I do not think that your conclusion to license Site E is supported by the evidence that has been collected and yet should be collected about all the alternatives. This is not the way to site a landfill. There is too much potential for adverse environmental impact and the risks will be with us a long, long time. Site E was selected first and found to be adequate. What the community needs is an unbiased authority J-19 to examine it in more detail and determine the BEST alternative for our region. We are stepping backwards into a solid waste system that will cost tens of millions of dollars and have huge potential for negative environmental impacts with no authorities having adequately examined this. J-19

We can do much better.

Jeff K. Claassen

JEFF CLAASSEN
5545 KEIR ROAD
HELENA, MONTANA 59601

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JUN 0 4 1993

MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID AND HAZARDOUS WASTE BUREAU

Dear Mr. Wilbur,

After a review of the draft EIS, I have limited my disappointment with the scope of the document to three important points.

First, I had hoped to read an impartial, objective comparison between Site A (which, lest we forget, was the original top choice of Damschen and Associates), the CCSS site, and Site E. I was disappointed by the lack of new research and cost comparisons. Aside from one test well at Site A, all the imcomplete, and now outdated research from the E.A. was simply regurgitated for the EIS. K-1

Second, on nearly every page of the EIS, the Subtitle D regulations are referred to. The majority of all conclusions endorsing Site E are based on compliance with Subtitle D regulations. Currently, it appears that these regulations wont be required for another two years. Does that mean a proposed new landfill at Site E wont be required to operate under these new guidelines? The application currently doesnt incorporate any of the safer technologies soon to be required under Subtitle D regulations. Doesnt anyone want to build, operate, or license a safer landfill than Scratchgravel? K-2

Third, since no permanent engineering solution has been found to isolate leachate completely from the groundwater; the threat to our acquifer has not been properly addressed in the EIS. The applicant's engineering consultant's theory was that "the northwest corner of the site is a recharge area, with ground water moving under the site to the west, south, and south east directions". Hardly a low impact area to contaminate. K-3

On a more emotional, rather than intellectual level; I was recently struck by an essay by Wendell Berry. Mr. Berry was attending a meeting regarding the licensing of a nuclear power plant in his home state, but much of what he said rang true for me. I will include the essay in my comments on the following pages. K-4

Thank you for your careful consideration.

Sincerely,

Terri Claussen

HIGHER EDUCATION
AND
HOME DEFENSE

Local life is being destroyed by powerful people who live beyond the bad effects. By Wendell Berry

Several years ago, I attended a meeting in Madison, Indiana, that I have been unable to forget, it seems so emblematic of the fate of our country in our time. In the audience at that meeting were many citizens of local communities, my own among them, who were distrustful of the nuclear power plant then being built (but now discontinued) at Marble Hill. Seated on the stage were representatives of Public Service Indiana, the company that was building the power plant, and members of the Nuclear Regulatory Commission, whose job it presumably was to protect us from the acknowledged dangers of the use of nuclear power, as well as from the already recognized deceits and ineptitudes of Public Service Indiana.

The meeting proceeded as such meetings typically proceed. The fears, objections, questions, and complaints of the local people were met with technical jargon and with bland assurances that the chance of catastrophe was small. In such a confrontation, the official assumption apparently is that those who speak most incomprehensibly and dispassionately are right and that those who speak plainly and with feeling are wrong. Local allegiances, personal loyalties, and private fears are not scientifically respectable; they do not weigh at all against "objective consideration of the facts"—even though some of the "facts" may be highly speculative or even false. Indeed, in the history of such confrontations, the victories have mainly gone to the objective considerers of the so-called facts.

Those considerers were then still winning at Marble Hill, even though the fraud and incompetence of Public Service Indiana was a matter of public record. But that meeting produced one question and one answer that tell us all we need to know about the nature of such an enterprise, and about the role of education in it. A lady rose in the audience and asked the fifteen or twenty personages on the stage to tell us how many of them lived within the fifty-mile danger zone around Marble Hill. The question proved tactically brilliant, apparently shocking the personages on the stage, who were forced to give it the shortest, plainest answer of the evening: *Not one.* Not a single one of those well-paid, well-educated, successful, important men would need to worry about his family or his property in the event of a catastrophic mistake at Marble Hill.

This story would be less interesting if it were unusual. My point, of course, is that it is *not* unusual. Some version of it is now happening in this country virtually everywhere, virtually every day. Everywhere, every day, local life is being discomforted, disrupted, endangered, or destroyed by powerful people who live, or who are privileged to think they live, beyond the bad effects of their bad work.

A powerful class of itinerant professional vandals is now pillaging the country and laying it waste. Their vandalism is not called by that name because of its enormous profitability (to some) and the grandeur of its scale. If one wrecks a private home, that is vandalism, but if, to build a nuclear power plant, one destroys good farmland, disrupts a local community,

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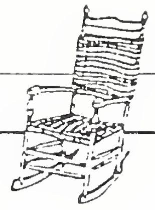

and jeopardizes lives, homes, and properties within an area of several thousand square miles, *that* is industrial progress.

The members of this prestigious class of rampaging professionals must meet two requirements. The first is that they must be the purest sort of careerists—"upwardly mobile" transients who will permit no stay or place to interrupt their personal advance. They must have no local allegiances; they must not have a local point of view. In order to be able to desecrate, endanger, or destroy a *place*, after all, one must be able to leave it and to forget it. One must never think of any place as one's home; one must never think of any place as anyone else's home. One must believe that no place is as valuable as what it might be changed into or as what might be taken out of it. Unlike a life at home, which makes ever more particular and precious the places and creatures of this world, the careerist's life generalizes the world, reducing its abundant and comely diversity to "raw material."

I do not mean to say that people with local allegiances and local points of view can have no legitimate interest in energy. I do mean to say that their interest is different in both quality and kind from the present *professional* interest. Local people would not willingly use energy that destroyed its natural or human source or that endangered the user or the place of use. They would not believe that they could improve their neighborhoods by making them unhealthy or dangerous. They would not believe that it could be necessary to destroy their community in order to save it.

The second requirement for entrance into the class of professional vandals is "higher education." One's eligibility must be certified by a college, for, whatever the real condition or quality of the minds in it, this class is both intellectual and elitist. It proposes to do its vandalism by thinking; insofar as its purposes will require dirty hands, *other* hands will be employed.

Many of these professionals have been educated, at considerable public expense, in colleges or universities that had originally a clear mandate to serve localities or regions—to receive the daughters and sons of their regions, educate them, and send them home again to serve and strengthen their communities. The outcome shows, I think, that they have generally betrayed this mandate, having worked instead to uproot the best brains and talents, to direct them away from home into exploitative careers in one or another of the professions, and so to make them predators of communities and homelands, their own as well as other people's.

Education in the true sense, of course, is an enablement to *serve*—both the living human community in its natural household or neighborhood and the precious cultural possessions that the living community inherits or should inherit. To educate is, literally, to "bring up," to bring young people to a responsible maturity, to help them to be good caretakers of what they have been given, to help them to be charitable toward fellow creatures. Such an education is obviously pleasant and useful to have; that a sizable number of humans should have it is probably also one of the necessities of human life in this world. And if this education is to be used well, it is obvious that it must be used some *where*; it must be used where one lives, where one intends to continue to live; it must be brought home.

When educational institutions educate people to *leave* home, then they have redefined education as "career preparation." In doing so, they have made it a commodity—something to be *bought* in order to make money. The great wrong in this is that it obscures the fact that education—real education—is free. I am necessarily well aware that schools and books have a cost that must be paid, but I am sure nevertheless that what is taught and learned is free. None of us would be so foolish as to suppose that the worth of a good book is the same as the money value of its paper and ink or that the worth of good teaching could be computed in salaries. What is taught and learned is free—priceless, but free. To make a commodity of it is to work its ruin, for, when we put a price on it, we both reduce its value and blind the recipient to the obligations that always accompany good gifts: namely, to use them well and to hand them on unimpaired. To make a commodity of education, then, is inevitably to make a kind of weapon of it because, when it is dissociated from the sense of obligation, it can be put directly at the service of greed.

The people on the stage at Marble Hill meeting may have thought of themselves as "public servants." But they were servants, at best of the *general* public, which means, in practice, that they might be enemies at any time to any particular segment of the general public. As servants of the "general good," they stood ready to sacrifice the good of any particular community or place—which, of course, is a way of saying that they had no reliable way to distinguish between the public interest and their own. When they appeared before us, they were serving their own professional commitment and their own ambition. They had not come to reassure us so far as they honestly could do so or to redress our just grievances. They had not come even to determine if our grievances were just. They had come to mislead us, to bewilder us with the jargon of their expertise, to imply that our fears were ignorant and selfish. Their manner of paying attention to us was simply a way of ignoring us.

That meeting, then, was not really a meeting at all but one of the enactments of a division that is rapidly deepening in our country: a division between people who are trying to defend the health, the integrity, even the existence of places whose values they sum up in the words "home" and "community," and people for whom those words signify no value at all. ○

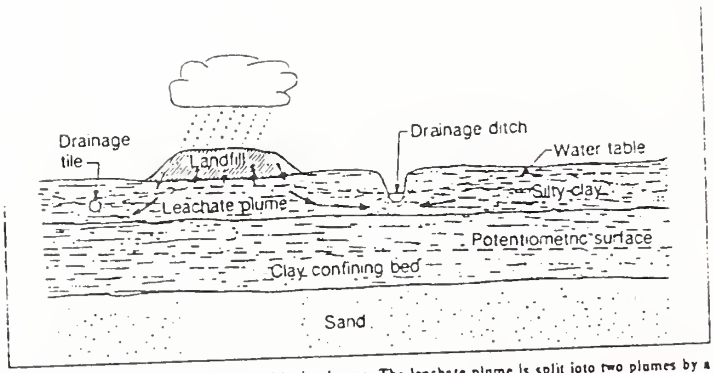

Figure 3. Single aquifer interbedded with clay lenses. The leachate plume is split into two plumes by a clay lens. One plume discharges into a stream near the landfill while the other plume moves deeper into the aquifer and flows to a more distant discharge point. *(U.S. Environmental Protection Agency, 1977)*

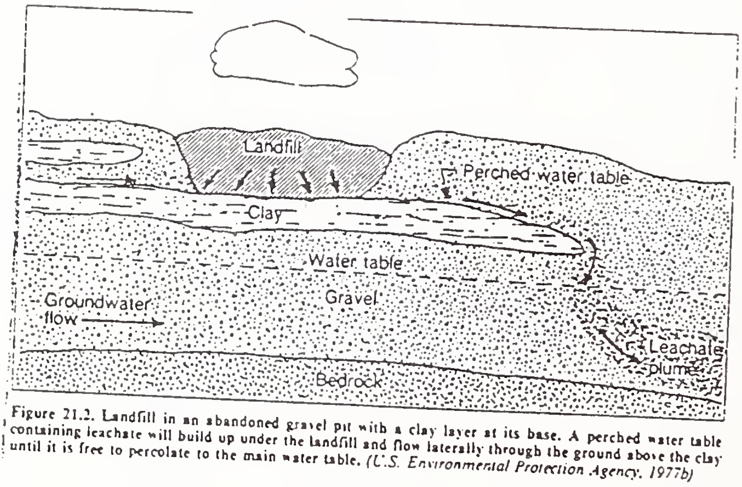

Figure 21.2. Landfill in an abandoned gravel pit with a clay layer at its base. A perched water table containing leachate will build up under the landfill and flow laterally through the ground above the clay until it is free to percolate to the main water table. *(U.S. Environmental Protection Agency, 1977b)*

APPENDIX 21.A.

Typical Geologic Settings that Demonstrate the Interaction between Landfill Leachates and Local Hydrogeology

The examples presented below illustrate how contaminants are transported in common hydrogeologic settings.

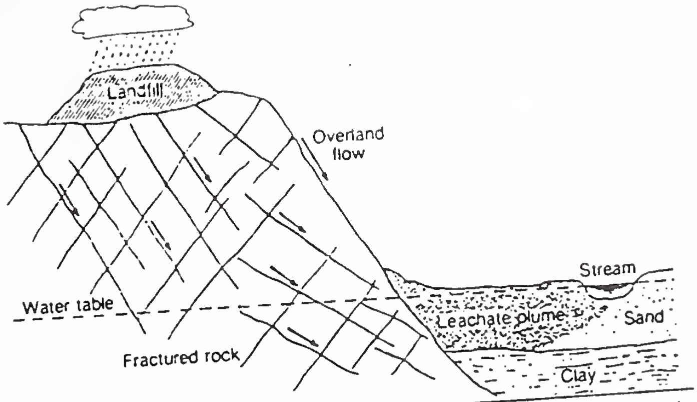

Figure 1. Fractured rock surface with a deep water table. Leachate flows into and through interconnecting fractures and discharges either at the surface or into the subsurface where it moves with the groundwater to some more distant discharge point. *(U.S. Environmental Protection Agency, 1977)*

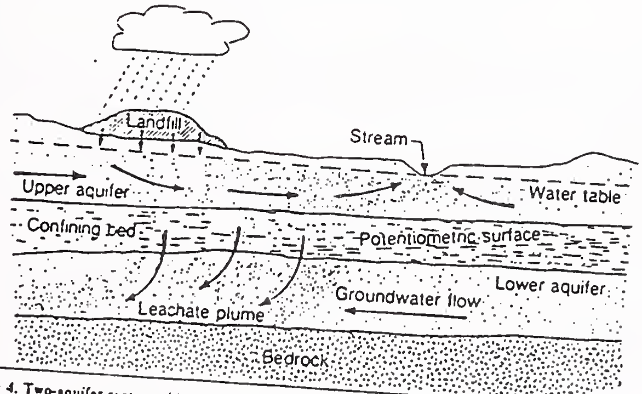

Figure 4. Two-aquifer system with opposite flow directions. Leachate first moves into and flows with the groundwater in the upper aquifer. Some of the leachate eventually moves through the confining bed into the lower aquifer where it flows back beneath the landfill and away in the other direction. *(U.S. Environmental Protection Agency, 1977)*

JUNE 4, 1993

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AND ENVIRONMENTAL SCIENCES
SOLID AND HAZARDOUS WASTE BUREAU

MR. JON DILLIARD
MGR. SOLID WASTE PROGRAM
MDHES

DEAR SIR:

I AM PROTESTING THE PERMITTIN OF SITE 'E' FOR A COUNTY LANDFILL. WE HAVE NOT BEEN CONVINCED OF THE SAFETY TO WATER, BOTH SURFACE AND UNDERGROUND. L-1

ALL SURFACE WATER FLOWS TO EITHER LAKE HELENA OR HAUSER LAKE.

CEDAR CREEK WHICH HEADS A SHORT DISTANCE BELOW SITE "E" ON THE EAST SLOPE IS FED BY NUMEROUS SPRINGS UPSLOPE TOWARD SITE 'E'. THIS CREEK FLOWS YEAR AROUND SO OBVIOUSLY IS NOT RELATED TO IRRIGATION RUNOFF.

THIS CREEK FLOWS MORE THAN ½ MILE THROUGH LAKESIDE RANCH, WHICH OUR PROPERTY AND RESIDENCE, BEFORE EMPTYING INTO HAUSER LAKE. L-2

IT APPEARS THAT NOT ENOUGH STUDY OF THE UNDERGROUND WATER HAS BEEN DONE TO ASSURE US THERE WILL BE NO CONTAMINATION. L-3

M.D. LAWRENCE
M. D. Lawrence

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THOMAS C. MORRISON
Attorney at Law
Suite 3J
Arcade Building
111 N. Last Chance Gulch
Helena, MT 59601-4144

June 4, 1993

Of Counsel: JOHN R. KLINE
406-443-1040
Fax 406-442-9558

Mr. Jon Dilliard
Department of Health
& Environmental Sciences
Solid Waste & Hazardous Waste Bureau
Cogswell Building
Helena, Montana 59620

Re: Comments on proposed Environmental Impact Statement

Dear Mr. Dilliard:

This letter sets forth my comments on the proposed Environmental Impact Statement (EIS), involving the proposed licensing for the Lewis & Clark County Site E landfill. My comments are principally focused on the economic impacts, which MEPA unambiguously requires be considered. A final and complete EIS must fully consider all economic impacts.

In recent months, even without attempting to needlessly support the excessive cost for establishing the Site E landfill, the Lewis & Clark county government has already diminished or threatened to diminish (and in many cases eliminate) agricultural extension services, weed control programs, library facilities, fairground facilities and other important services. The economic impact of overspending for a county landfill will have a serious environmental impact on Lewis & Clark county residents. Those impacts can not be ignored. Informed economic choices must be available in the decision making process to assure that unneeded and unwanted but adverse economic impacts can be avoided. M-1

A proper EIS will assure that informed choices can be made. The proposed EIS does not adequately inform and must be revised to properly address the full extent of the economic choices available for any prudent licensing decisions to be made. To a limited extent the proposed EIS speculates on costs, providing sweeping, unquantifiable ranges of figures that are not supported by any reliable data. A proper EIS must not be predicated on M-2 speculation. Nor can a responsible EIS rely (as it has) on the self-serving but uninformed economic speculations of unknowledgeable, but biased county officials. To do so (as it has) renders the proposed EIS and the EIS procedures themselves a mockery. A legally defensible EIS must be based on reliable data that can allow a proper evaluation of the economic impacts. M-2

COMPARATIVE START-UP COSTS

The proposed EIS indicates that total **capital costs** for developing Site E will range between $13.3 million and $21.65 million! In spite of this near 100% spread in estimated costs, the proposed **EIS** unwittingly, but facetiously indicates it has included a 10% contingency for unforeseen overruns![1] Inexplicably, no similar comparisons are offered for the other proposed public or private landfill sites. M-3

Proposed EIS tables 4.12-1 and 4.12-2 show **start-up construction costs** range between $6.2 million and $9.8 million for Site E and between $6.2 million and $9.7 million for Site A! The CCSS alternative start-up costs are quantified at a precise $170,500. No other start-up costs are shown for other public or private alternatives. The above-indicated disparity or spread in Site E and Site A start-up costs is due to lack of adequate economic data and indicative that the applicants do not want to make an informed choice but want to whitewash the EIS process. M-4

Similarly, the proposed EIS indicates that an additional $200,000 to $2,000,000 could be required to install a proper **gas management system**, which costs are not included in the Site E start-up numbers. Nevertheless, for unexplained reasons, these costs were not included in the final figures. M-5

The proposed EIS does not adequately include present and future costs for **highway improvements and maintenance** to Site E, which is the longest hauling route on the poorest roadway, and least supported by federal funds. Some Site E road improvements have already been made in anticipation by the over-eager applicants and presumably to cause these costs to be ignored as part of the Site E start-up costs. M-6

The EIS has not included any **costs for wrongful taking**. Damages for wrongful taking will be compenseable to adjoining Site E landowners, if a Site E license is issued. Wrongful taking recoveries will be measurable by the radical drop in land M-7 values; from potential home development sites near the new 27 hole Fox Ridge golf course to uninhabitable farmland. The U.S. Constitution protects U.S. citizens with the right to "just compensation" for such losses, arising from involuntary public takings. The Site E landowners will be those with the greatest claims, because none of the other landfill alternatives offer such radical changes in potential land use. M-7

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[1] In comparison, in my letter of July 16, 1992 to Mr. Wilbur of your Department, I stated that contrary to the applicant's representations, DHES experts predicted start-up costs for the Site E landfill approximate $2,000,000, and not the $975,000 budgeted by the county for next year!

Wayne Miller, one of those adjoining Site E landowners has publicly offered to trade his Site A with the applicants in order to keep a Site E landfill from spoiling the development potential of his adjoining 320 acre farm. He knows that the residue of his land that would adjoin Site A would not be so adversely affected. The proposed EIS has ignored this important difference. Mr. Miller's proposed trade, itself, is and will be proof that the all acreage adjoining **Site E has a higher best use as potential residential development property** and will be rightfully used in sustaining large claims against the county for damages from a wrongful taking. M-8

Mr. Greenfield is another adjoining Site E landowner with a personal residence within a few feet of Site E. Mr. Hoff, the owner of the Fox Ridge golf course, will also lose substantial property value from the development of Site E. None of the other landfill alternatives (public or private) bear this special exposure. Condemnation law suits will predictably and immediately follow the licensing of Site E. The proposed EIS **fails to properly evaluate these very real costs, unique to Site E, and a legally defensible EIS must consider them.** M-9

The EIS has not properly measured the cost in lost **real property tax revenue from the loss of developing Fox Ridge homes** surrounding the Fox Ridge golf course that is too close to Site E. The proposed EIS incorrectly disregards this factor, when in reality, the City of Helena is a living example of the value of property surrounding a nice golf course. In a county the size of the State of Rhode Island, it makes no sense to pick the most potentially developable land and denigrate it with a tri-county landfill. No other landfill site bears the consequence of a serious loss of real estate tax revenue. M-10

COMPARATIVE OPERATING COSTS

Proposed EIS tables 4.12-1 and 4.12-2 show **annual operating and maintenance costs**, ranging between $420,000 and $825,000 for Site E and exactly the same range for Site A. The CCSS alternative is not indicated. The proposed EIS fails to adequately compare the cost of using the CCSS alternative, even though CCSS has made a written commitment to offer a subtitle D quality trash disposition service at $38 per ton without imposing any burden of capital costs! The proposed EIS fails to M-11 adequately compare the cost of continuing Helena's contract with BFI in Great Falls, quantifiable at $25 per ton, including hauling! M-11

UNRELIABLE DATA

The EIS writers were forced to rely on the landfill applicants' **unreliable, unsupported, incomplete, but self-serving economic data.**[2] The EIS writers had no meaningful way to critique the landfill license applicants calculations, because the source of those calculations has never been made available. No one, including the EIS writers, have had any means to analyze the numbers. Because of this, the quality of the proposed EIS economic analysis has been compromised and reduced to the lowest common denominator, the applicants' insupportable cost guesstimates. If not remedied, reliance on the applicants' cost estimates will render the whole EIS process without any substantive procedural value or meaning. M-12

During the last week of May, after the public hearing on the proposed EIS, the applicants publicly admitted that they did not previously calculate the cost of operating the Site E landfill and have substantially increased their prior estimates to $22.50 per ton! The applicants have not disclosed how this sum was calculated, even though it is conveniently lower than quantifiable cost hauling and disposing of trash in Great Falls (a factor that had been previously raised at the public hearing on the proposed EIS)! The proposed EIS did not have the benefit of the applicant's new economic data or how the new figures are supported! Nevertheless, a **final EIS should evaluate the applicant's new cost estimates and correct any deficiencies in its underlying assumptions and data!** M-13

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[2] The lack of reliability and self-serving nature of the applicants' cost figures are demonstrated by its originally projected preliminary plan costs of $40,000 which have now escalated to over $250,000. Similarly, the applicants originally predicted a transfer station would cost $800,000, but were later advised by their agent, Damshen Associates, that the transfer station would cost $1,250,000. The transfer station is now being built for $2,760,000, but purposely obsolete, lacking in design for railroad use (presumably a deliberate effort to subterfuge more favorable alternatives which could take advantage of railroad transport; i.e. the CCSS site or Site A or other alternatives, since Site E has no railroad connections). M-14

CONCLUSION

The proposed EIS has parasited off of the applicants' own unsupported cost speculations. The indicated variation in start-up costs might have as easily been stated as being between $500 to $50,000,000. The indicated variation in operating and maintenance costs might have as easily been stated as being between $50 to $5,000,000 annually. The economic data in the proposed EIS is so ill-founded and so variant, that it has rendered the EIS totally uninformative and thus procedurally and legally defective. M-15

The purpose of the EIS procedure is to inform so that informed and responsible decisions can be made. Without adequate economic data, the important and relevant economic impacts can not be properly analyzed. Consequently, informed decisions can not be reasonably made unless the EIS is revised and proper economic data gathered for Site E and all alternatives and the properly evaluated and compared. M-16

It has been difficult to comment the suggested economic impacts in the proposed EIS. This is because its analysis is both intolerably tentative and superficial and its supporting data, nonexistent. The preparers of the EIS can not be criticized, if the applicants have been unwilling to pay them to obtain this needed information. M-17

The EIS process is not a window-dressing exercise, no more so than the public hearings that should have held when the landfill site was first considered.[3] The applicants' contumacious disregard for public laws and procedures and their arrogant stonewalling of the EIS process should not be rewarded with a premature license to operate the Site E landfill. The applicants' defiance of the EIS process should not be tolerated. To do so would allow local politics to subordinate sound environmental decisions that MEPA is designed to protect against. M-18

The State of Montana should and must require the proposed EIS to be revised in order to properly meet the requirements of MEPA and provide a complete, comprehensive, and informative analysis of all enconomic impacts regarding the proposed Site E landfill. M-19

Very truly yours,

THOMAS C. MORRISON
Co-counsel for the Citizens
For A Responsible Landfill

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[3] Mr. Miller's public testimony indicated that the governing officials had pre-selected Site E, behind closed doors, and were holding public hearings as a window-dressing exercise without regard to the legal necessity to do so. M-20

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MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID AND HAZARDOUS WASTE BUREAU

Janet G. Tenesch
3434 Spurgin Rd. #2
Missoula, MT 59801
May 29,1993

DHES/John Dilliard
836 Front Street
Helena, Mt. 59620

I am opposed to the proposed new landfill going in at Site E as described in the DEIS for the following reasons.

1. The DEIS points out in at least 8 different places that the
county's plans do not meet minimum requirements set forth in
Subtitle D and also that Subtitle D mandates existing landfills
to come into compliance within the next 5 years, although some N-1
requirements will be effective immediately. If by some miracle
the landfill were to become operational before 10/9/93, which
requirements would have to be satisfied immediately? Which ones
would have to come into compliance within the next 5 years? Were
any of these costs considered in the O & M costs for the future?
If none of these costs were estimated in the construction and N-2
operational summary then the whole thing is a complete
misrepresentation to the rate and taxpayers of Lewis and Clark
County. The costs per ton will be much more than shown. Also,
who is going to make sure they comply with the new regulations?
Or will they, like the Scratchgravel landfill be granted N-3
variances and not have to comply--thereby being allowed to be a
higher risk for contamination?

2. The DEIS states "Site A ranked highest and Site E lowest when
rated for environmental, sociological and economic reasons. Upon
review of these results Site E was selected because of its **low
purchase price.** I think this decision was made in haste and
those responsible should have done more homework before N-4
purchasing anything. The total capital costs as shown in table
4.12.1 are about the same for Site A and Site E. It states that
Site A will not affect any private wells [Site E will] and the
visual impact will be less because of topography [and location].
Yes $127,000 was spent for Site E, but I think this is a poor
reason for proceeding with this plan. That is only a very small
portion of what the whole thing will cost. I can just see the
Chamber of Commerce in about 15 years promoting fishing, boating,
all water sports, wildlife viewing at Lake Helena, Hauser Lake
and the Regulating Reservoir---and golfing all within a 3 mile
radius. "And for your special viewing pleasure please take note N-5
of our county landfill statigically placed between these three
bodies of water and the golf course." Do you really want that on
your epitaph? Do you want the generations for the next several
100 years to have to live with this decision? Look at the
overall long term picture. Site E is not a good choice.

3. Conflicting or misleading information:

A." Export may present considerable logistic and political obstacles"---and then 6 pages later it states that both Great Falls and Missoula have granted permission for solid waste to be transported into their landfills [which are both privately owned and operated and meet or exceed current regulations]. **So what are the obstacles?** N-6

B.Estimated cost of exporting were estimated at $46.75 to $53.70 per ton. The actual cost as quoted by Solid Waste Management of Great Falls is $26.90 per ton. These costs were so far off it almost makes one think they were overinflated in order to make a dump site within the county look more affordable. It is also interesting to note that the Billings landfill is only going to charge the City of Livingston $6.93 per ton. What would they charge L & C Co.? N-7 It could possibly be shipped by rail car. N-8

C.The fear that L & C County's liability for solid waste management would increase if it were exported is a feeble argument. The TYPE of garbage generated will not be different just because it is going to be exported. You could have "special" household hazardous waste collection days so as to have a better control on those types of waste. The liability and risk in transporting it is slight. There might be an accident. But the cleanup on that would be minimal. N-9

D.On page 4-60 it states that the estimated total Capital costs for Site E are $13.3 to $21.6 million which translates to $3.08 to $4.84 per ton. On the next page, Table 4.12.1, it states the estimated capital costs for Site E to be $6.2 to $9.7 million, which translates to $3.08 to $4.84 per ton. How can these two figures translate to the same amount? According to my calculations, 13.3 to 21.6 translates to $6.65 to $10.80 per ton----more than double the amount! Should I flip a coin to decide which page of information is correct? N-10

E.On page 2-11 it states "It was determined that Sites B and C would require liner systems, thereby increasing their capital and development costs, while Sites A and E would not need liners [See section 2.2.7 for a discussion regarding the validity of this assumption in light of Subtitle D requirements passed after the siting study was prepared] **SECTION 2.2.7 IS NOT THERE.** PAGE 2-31 GOES FROM 2.2.6 TO 2.3. WHY DID THIS GET LEFT OUT??? N-11

F.I really question the ground water consequences[4.2.1.1]. The DEIS states that ground water was encountered at 81 feet BGS. Yet standing water level in 6 of the 11 test wells were at 13',18',19',41',63',and 98'in Phase I 80 acre parcel. If the waste cells will be 41'bgs, and there is a requirement for a minimum of 10'-20' seperation between the bottom of the landfill and the groundwater table---how is this going to work? There is a substantial difference 13' and 81'. Also in 4.2.1 it states the nearest private well is 1200 feet to the NE. What about the private well 400 feet to the NW? N-12

4. The DEIS states that uranium is not a significant factor based on a 1958 report done by George E. Becraft. But my father, Bill Greenfield Sr.[deceased] had leased minerals rights to a uranium company by the name of St. Joe's, out of California, in the late 1970's to early 1980's. They did some test drilling on his property [which borders Site E] and found significant traces of uranium. They paid him a nominal fee for several years with the intention of mining the uranium, but cancelled the lease when the market fell out of uranium because of the health hazards. Therfore I question whether a report from 1958 is sufficient enough to determine whether uranium is or is not a potential problem. Are you willing to take that risk? N-13

5.The Montana Solid Waste Management Act encourages private industry and states that municipalities cannot often afford to build solid waste infrastructures or take the risks associated with landfill management. The county's proposal does not meet minimum requirements, yet the private landfills in Missoula and Great Falls meet or exceed standards. N-14

I think the DEIS is contradictory and incomplete. I do not believe that Lewis and Clark County should be granted a permit for a landfill at this time. N-15

I think all responsible parties should go back to the drawing board and consider some other options while they transport their solid waste elsewhere for a while. N-16

Consider private industry, whether it is CCSS Landfill or BFI or SWM Systems. N-17
Consider joining with several other counties and make it more cost effective for a larger area. N-18
Investigate more thoroughly the problem of Site A being within 10,000 feet of a runway. Get an official FAA opinion. N-19
If Lewis and Clark County officials persist on running a landfill---do it right and minimize your risk and the taxpayers risk in the future. It may cost more upfront, but it will be cheaper in the long run. N-20

REMEMBER--THE DECISION YOU MAKE WILL AFFECT MANY GENERATIONS TO COME--ONCE YOU START THIS LANDFILL THERE WILL BE NO BACKING OUT OF IT. DO NOT MAKE A WRONG DECISION! N-21

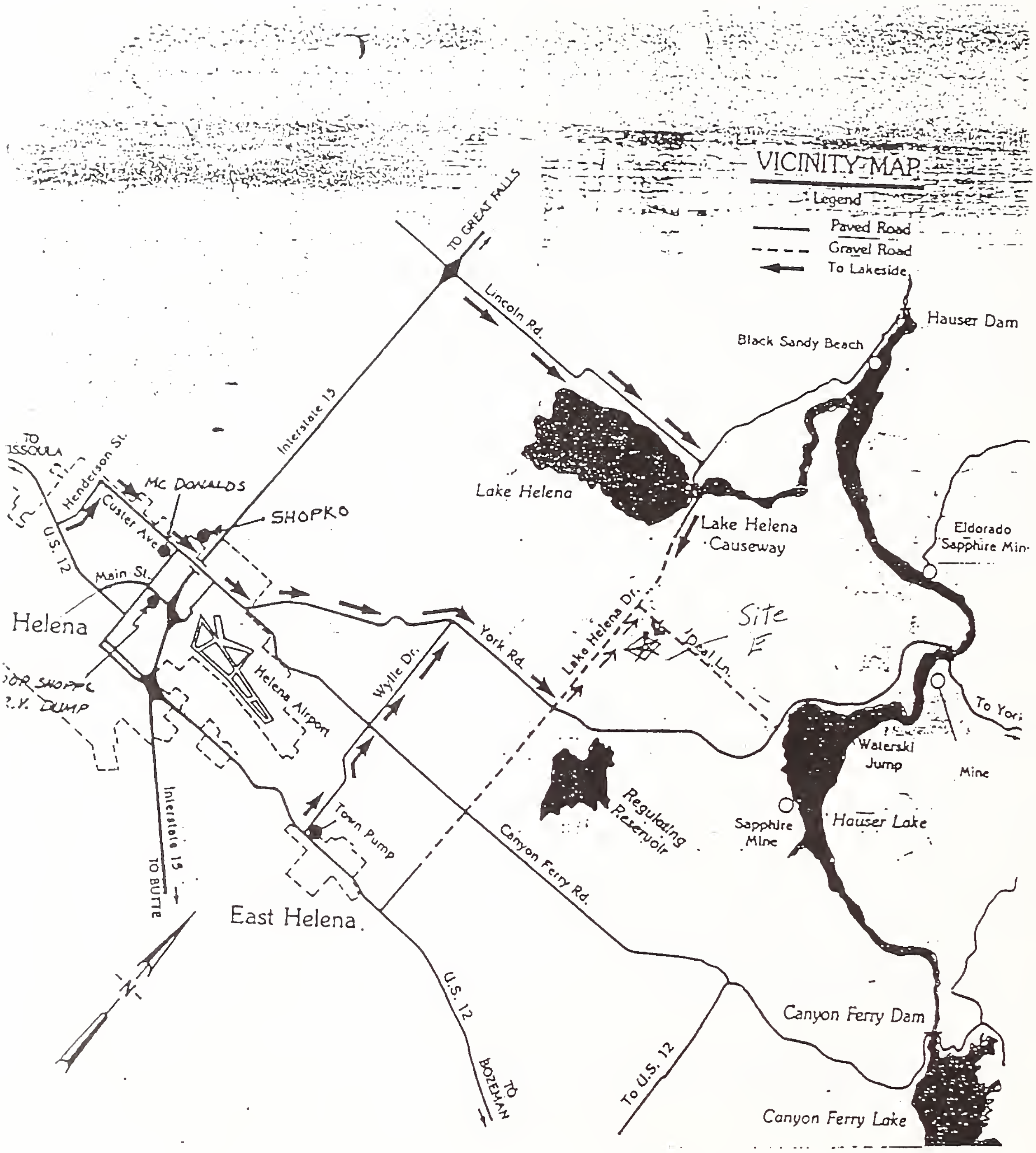
Sincerely,

Janet G. Tenesch

Janet Greenfield Tenesch

cc: L & C Co. Commissioners
Helena City Comiisioners
John Dilliard/DHES

Jim Wilbur/DHES
DHES/Water Quality Bureau
DFWP
US EPA
L & C Co. Health Dept.



Is Site E really the best choice for years to come? Its the beginning of the Missouri Headwaters. In my opinion there has got to be a much better option.

MONTANA RECREATION LANDS

MONTANA provides a multitude of outdoor recreation sites, from the vast Great Plains to the rugged Rocky Mountain highlands. There are nearly 500 campgrounds and recreation areas maintained by the U.S. Forest Service, the U.S. Bureau of Land Management, the National Park Service, and the Montana Department of Fish, Wildlife, and Parks.

STATE PARKS

BANNACK is the site of the state's first major gold strike in 1862. The mining camp became the capital of the Montana Territory in 1864, but today is a ghost town. Original structures still standing include the Capitol Building, Hotel Meade, the Masonic Temple, and the town jail. 834-3413

GIANT SPRINGS was discovered by Lewis and Clark in 1805. Visitors may tour the nearby fish hatchery and picnic by the Missouri River. There is a visitor center, and a nearby overlook offers scenic views of Rainbow Falls. 454-3441

LEWIS AND CLARK CAVERNS protects many unique geological formations. Stalactites, stalagmites, and flowstone line these colorful underground grottos. A campground is provided, and tours of the caves are conducted during summer months. 287-3541

LOST CREEK has a campground nestled between limestone cliffs that rise 1,200 feet above Lost Creek Canyon. Visitors particularly enjoy scenic Lost Creek Falls. 542-5500

MAKOSHIKA is known for its badlands and dinosaur fossils. To the Sioux indians, Makoshika meant "bad earth." The park's pine and juniper forests offer camping and picnic sites, an archery and shooting range, and nature trails. 365-8596

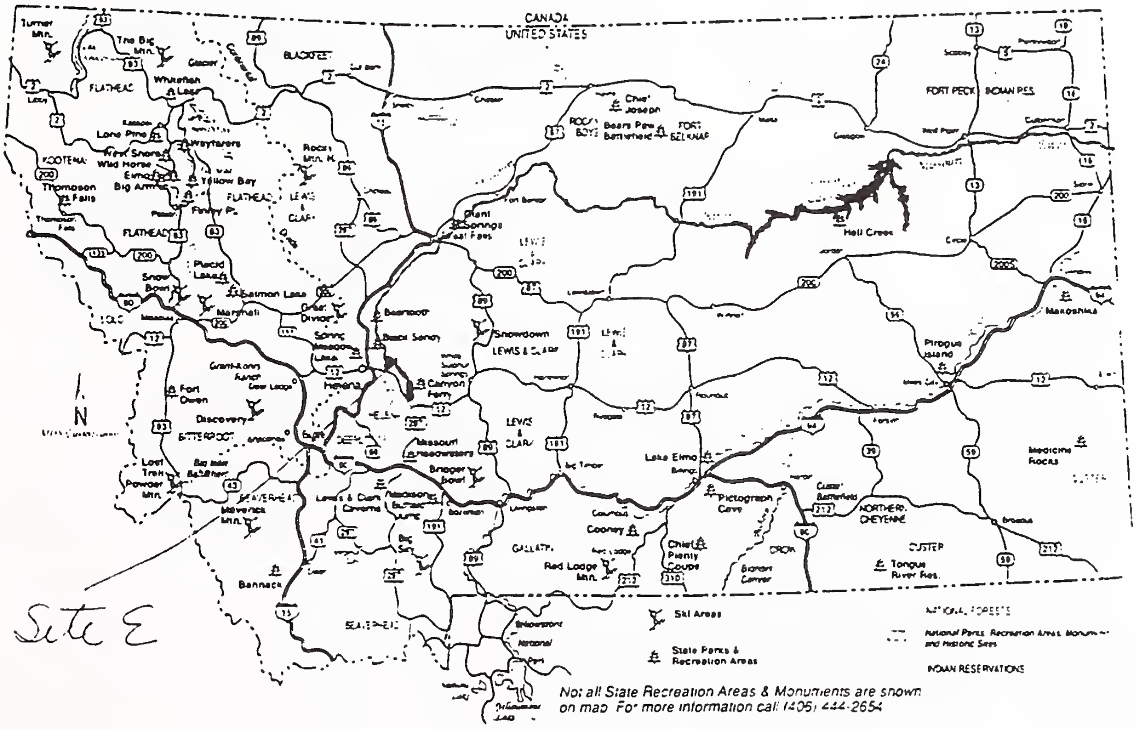
MEDICINE ROCKS was ceremonial ground where Indian hunting parties summoned magical spirits and practiced "Big Medicine." The park is now known for its unique sandstone rock formations that resemble swiss cheese. The undeveloped park is a wildlife haven. 232-4365

MISSOURI HEADWATERS marks the where the the Gallatin, Jefferson, and Ma rivers converge and become the Missour Discovered by Lewis and Clark, this site i popular for camping, rafting, hiking, and f Displays depict area history. 994-4042

WEST SHORE is situated on Montana's Flathead Lake. A scenic overlook provides spectacular views of the lake and surround mountains. There is boating access to the and an interpretive display explains the reg 752-5501

WILD HORSE ISLAND is the largest of islands in Flathead Lake. It was once used pasture by the Salish and Kootenai tribes. island, accessible only by boat, is now hom bighorn sheep, mule deer, wild horses, eag and falcons. 752-5501

The above is only a sample of Montana's state parks. more information call ~~444~~-3750. For information on recreation sites, contact the appropriate agency listed **Blue Pages of Government Listings.**



Site E

Not all State Recreation Areas & Monuments are shown on map. For more information call (406) 444-2654

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AND ENVIRONMENTAL SCIENCES
SOLID AND HAZARDOUS WASTE BUREAU

Jon Dillard
Manager, Solid Waste Program
MDHES, 836 Front Street
Helena, MT 59620

Dear Mr. Dillard,

Re: Draft EIS Lewis and Clark Co. Landfill

I find the draft EIS deficient in the following areas and feel that until these areas are examined and the questions answered an informed decision by all parties involved in the decision to license this landfill cannot be made. 0-1

Section 3.9 Roads and Transportation

The first paragraph states no other transportation modes such as rail.... should be used for transporting waste to the landfill. Rail is a very viable alternative for Site A or CCSS landfill. It is used by many cities to transport solid waste- Portland and Seattle for example. Advantages of rail vs. truck: 0-2

1. Routes pass thru industrial areas and are already impacted by haul traffic.

2. Provides alternative on site storage either at transfer station or at landfill. Windy condition at site may not allow dumping and covering- two day transfer station storage capacity is enlarged.

3. Link by rail is not subject to closure due to flooding, spring breakup, or drifting snow.

4. R.V.'s, vehicles with boats, school buses, and farm vehicles are all in conflict with haul traffic to site E. Rail would eliminate these conflicts.

5. Rail connection at transfer station could be used for transportation of recyclable materials. Rail connection at landfill site could be used to transport future, recyclable materials. 0-3

6. Rail eliminates the need to buy and maintain a fleet of haul trucks.

7. Rail reduces pollution and noise impacts in non-industrial areas.

8. Rail is not vulnerable to fuel cost fluctuations.

9. Rail reduces congestion at intersections. 0-3

10. Rail is safer and less vulnerable to accidents.

The transportation baseline study does not address the following:

1. Haul distances- Site E is approximately 2 miles farther than Site A, with 40,000 tons per year times 2 miles equals 80,000 Ton /Miles additional cost for life of landfill. 0-4

2. Jurisdiction of haul routes. Site A haul routes from Benton Ave to Smelter Road are on Primary System- 100% Federal funds for construction and maintaince.
Benton Ave and Custer Ave are on Federal Aid Urban System and compete with other FAU routes for limited funding.
York Rd.- secondary Highway- requires county funding. 0-5

Conclusion: Federal funds will maintain Site A or CCSS haul routes and county funds will maintain Site E haul route. These costs should be included in Site E operation costs.

3. Pavement design on various haul routes- report only states that roads are paved. Pavement on Federal Aid Primary routes is designed to carry heavy loads. For example the Federal Aid road log shows that HIghway 12, Primary Hwy #8, to have the following design characteristics as compared to York Rd.(FAS 280):

	FAP 8 (HWY 12)	York Rd. (FAS 280)
Year Built	55-78	45-81
Surface type	Plant mix or Port Cement	Bituminus surface*
Surface thickness	2.5"-6"	2"-5"
Base thickness	10"-24"	5"-18"
Surface width	60'-88'	22'-24'
Roadway width	60'-88'	22'-30'

0-6

* Bituminus Surface Treatment- built up by oiling over the years.

Conclusion: York Rd. is not designed for the projected traffic as is Hwy. 12. EIS does not provide county costs to reconstruct York Rd. to current Federal Secondary Standards (Warren School curve is an example of these standards) or estimate impact of haul traffic on York Rd. pavement structure.

Intersection levels of service (LOS) in report are for peak hour- presumely, haul traffic would be scheduled to operate during off-peak periods which are generally in LOC A-C levels. Traffic analysis does not take into account the added congestion of trucks on narrow two-lane road with no passing lanes vs. 0-7 trucks on four lane highways which provide a passing lane for vehicles to pass slow moving trucks. 0-7

Traffic analysis adds trucks to ADT as one vehicle- trucks are equilavent to up to six plus design vehicles depending on grades, and roadway design. 0-8

All of the above data and analysis is predicated on the basic assumptions in EIS--- one of which is that only trucks from the transfer station will operate and haul to the landfill. What about trucks from the rest of the county as their landfills close up---what about trucks from neighboring counties as their landfills close up ? In order to evaluate the cumulative impacts these impacts have to be considered. 0-9

ECONOMICS------

Where are the costs and budgets and data that we all need to make an educated evaluation of any of the options listed in the EIS ? In light of the recently signed contract with Great Falls it appears that the No Alternative is the best and cheapest alternative we have. (The recently published cost per ton at the Site E landfill by the county furnished no budgets or costs but are listed as costing less than the Great Falls option????) An educated evaluation rests on concrete economic data---- we need more time and reliable economic data to base our decision on. 0-10

Roger R. Sandiland
4924 Lakehome RD
Helena, MT 59601

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MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID AND HAZARDOUS WASTE BUREAU

MDHES, Solid & Hazordous Waste Bureau
836 Front Street
Helena, Mt. 59620

June 3,1993

Dear Mr. Jim Wilbur,

I am writing you in response to the EIS for the proposed landfill in Lewis and Clark County. I am one of the Greenfields'. Our family owns the other half section of site E. I am extremely concerned that the EIS is merely fulfilling federal requirements. You told me in a verbal conversation that the EIS would tell Lewis & Clark County what they would need to do to put in an environmentally sound landfill. P-1

The EIS is not committed to Subtitle D requirements. Why is this? Why is it that no genuine comparison is made of costs and locations? On page 2-22 of the EIS it states that management is not the primary issue but location is. When you are dealing with a county that is trying to save taxpayers' up front costs, I question this statement. Your job is to protect the environment. In many instances you say Site A is better than Site E. If location is so important then why does the low purchase price carry so much weight? This EIS simply justifies Site E. It has been a waste of your time and taxpayers' dollars to not give a complete comparison! P-2

I have several questions I am requesting a written response to.

1. What are the costs of other communities trash being shipped to Helena? P-3
2. What are the true costs of building the road to Site E? P-4
3. What are the total costs of building an environmentally sound landfill? P-5
4. What are the costs of buying neighbors out or impending lawsuits? P-6
5. Why were test wells only taken around the boundry? P-7
6. Why were there so few test wells dug on the other sites? P-8
7. Why were test wells dug in the fall and not the spring? P-9
8. Why is Cedar Creek omitted from consideration? P-10
9. What are the effects of the uranium in the soil being disturbed? What are the effects of radiation to the surrounding neighbors and to the workers operating equipment in the landfill? P-11
10. It is not clear in the EIS if the permit is for 320 acres, 189 acres or just 80 acres. Would these unclear numbers make the other acreage exempt from Subtitle D Requirements because of a technicallity? P-12
11. How can you come up with credible statistics with inadequate information? P-13
12. Why is the EIS not much different than the EA? P-14
13. Why is 2.2.7 missing in the EIS? P-15
14. How will Lewis and Clark County's liability increase if waste is transported? P-16
15. How are eagles adversely affected by being provided with more food? P-17
16. Why does table 4.12-1 state that shipping waste to Great Falls will cost around $40.00/per ton and it actually costs $26.90/per ton? P-18
17. Why was Site A not more thouroughly compared to Site E? P-19

I do not believe the State of Montana should be licensing any new landfills especially when the State does not have a Hazordous Waste Program for household hazordous waste. I own an office cleaning business. I know peoples' waste habits. If this landfill is licensed without thourough data then allowed to go in without the most environmentally sound technology, my land will surely become polluted! Missoula's P-20 landfill is state of the art. It costs $1 million dollars to line a 3 1/2 acre cell with a composite liner. It is more cost effective to spend the money up front than to try and fix the problem later. Helena's old dumps are a great example of mismanaged landfills. The State of Montana needs a master plan for their solid wastes before licensing any new landfills. The State of Montana should not license any municipalities to operate their own landfills. The State of Monatana should not be licensing new landfills until they back waste reduction programs all over the state. P-20

In closing, I object to the site chosen and I reject this EIS. This EIS does not represent a sound decision. It merely follows minimum regulations. P-21

Sincerely,
Nancy Greenfield Schmidt 415 Ford Msla Mt 59801
Nancy Greenfield Schmidt

cc: Margaret Crennan
Mike Murray
DHES, Water Quality Bureau
Jim Wilbur
Tom Huddleston
Linda Stoll-Anderson
Kay McKenna
Blake Wordal
Governor Marc Racicot

Governor Marc Racicot June 3, 1993
Helena, MT. 59601

Dear Governor Marc Racicot;

I am writing you in despair over the proposed landfill in Helena. My family owns the other half section of Site E. Site E should not be a consideration any longer because it sets in the middle of a recreational area. One of Montana's big industries to come is tourism. To allow a landfill there would be a crime. Q-1

I am very appalled at the inadequacy of the Draft Environmental Impact Statement that the DHES compiled! I am requesting you to fire the people who put it together. I thought an EIS was suppose to protect the environment. This is nothing more than a minimum fullfilment of regulations. Q-2

I can't ask you to fire the Commissioners of Helena but could you seriously reprimand them. They do not represent the state capitol city responsibly. Q-3

I do not think the State of Montana should be licensing any new landfills when we don't have a Hazordous Waste Program for household hazordous waste! I do not think the State of Montana should be licensing any new landfills for municipalities. I do not think the State of Montana should be licensing any new landfills until the state backs reduction and reuse programs. Montana State needs a master plan before permitting any new licenses. Q-4

What can you do about this for me?

Sincerely;

Nancy Greenfield Schmidt

cc; Margaret Crennan
Mike Murray
Jon Dilliard
Tom Huddleston
Linda Stoll-Anderson
Jim Wilbur
Kay McKenna
Blake Wordal

B. Robinson
W.J. Opitz
Curt
Steve

MEIC

MONTANA ENVIRONMENTAL INFORMATION CENTER

20 Years of Activism 1973-1993

26 May 1993

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MDHES
DIRECTOR'S OFFICE

Robert J. Robinson, Director
Department of Health & Environmental Sciences
Room C108, Cogswell Building
Helena, MT 59624

Dear Mr. Robinson:

The Montana Environmental Information Center appreciates the opportunity to comment on the Lewis & Clark County Landfill draft Environmental Impact Statement. After thorough review MEIC is convinced the document is deficient for the following reasons and a supplemental EIS is warranted before consideration of the alternatives can proceed. R-1

Scope

MEIC's main concern regards the inadequate scope of the draft EIS. According the Montana Environmental Policy Act the purpose of an EIS is to provide decision-makers with the information necessary to select a project alternative from among a list of alternatives based on the environmental impacts caused by each. The appropriate alternative can only be discerned if the document discloses the environmental consequences of the entire project.

Despite this purpose, the DEIS recognized that a large segment of the Site E proposal was not considered. The actual project covers 320 acres of land, "of which 189 acres would be used for landfilling at full build-out, providing solid waste disposal capacity for 91 years." (§ 2.2 DEIS) The DEIS only considered Phase I of the project, or the project's impact on 80 acres of land over a 50 year period. R-2

A supplemental EIS must be prepared pursuant to §16.2.636 Administrative Rules of Montana. This section clearly states that when information necessary to evaluate a project's impacts becomes available following a DEIS, the agency must prepare a supplemental EIS. Furthermore, in a case involving a comparable situation a Federal District Court also referred to the supplemental EIS when discussing the inadequacy of the EIS. Libby Gun & Rod Club v. Poteat, 457 F. Supp. 1177 (1978).

Subtitle D

The DEIS completely failed to provide an analysis of costs associated with each alternative. § 5.5 of the DEIS pointed out that the entire document was based on the assumption that Subtitle D rules would be in effect when the proposed landfill becomes operational. This assumption may or may not be valid. The costs R-3

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P.O. Box 1184 Helena, MT 59624 (406) 443-2520

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associated with each alternative cannot be developed and substantiated without first guessing what Subtitle D regulations will be. R-3

Currently, the EPA has adopted delayed regulations effective October 9, 1993, yet has asked for an extension of their adoption. The state is working toward developing regulations of their own that must be at least as stringent as federal regulations but that would allow the state more flexibility. Because the state regulations are only in the comment stage, their effect toward environmental protection can only be surmised. Because of this scenario the cost of each alternative has not and cannot be accurately estimated. The supplemental EIS must address this issue and provide cost estimates under each possible regulatory scenario. R-4

Costs

Table 4.12-1 estimated the annual operating costs between $420,000 and $835,000 for Sites A & E, yet provided no figures substantiating these totals. The DEIS acknowledged that the annual operating cost did not include the costs of leachate and gas management. What other essential costs were also excluded? In order for the public to evaluate the annual operating costs an itemization of costs must be included. R-5

Also excluded from the DEIS analysis was a section addressing how the rates will be determined. Although §4.12.1.1 listed the total capital cost per resident, and the annual O&M cost per resident, it excluded a discussion of whether the fees will be collected by volume. If so, the price established may affect the life of the landfill. The DEIS should address this point. R-6

Transportation

The initial assumption under the "Roads and Transportation" section was erroneous. The document assumed rail transport would not be available and the waste must be hauled from the transport station to the landfill by large trucks. Rail is available for transporting waste to Site A and possibly out of the region under the no action alternative. The cost of transporting refuse by truck must be compared to the cost of transport by rail. R-7

Even assuming truck transport, the analysis of transportation costs was deficient. First, footnotes to table 4.12-1 claim the cost of hauling was considered in the O&M category for alternatives A and E, yet was considered under the "hauling" category for the no action alternative. In order to have a complete and informed comparison of costs, hauling costs should be separated out of the O&M costs in A and E, itemized, and compared with the cost of hauling refuse outside the area. R-8

Furthermore, no analysis was provided regarding road development and maintenance. Large trucks making seven to ten daily round trips would increase the deterioration rate of roads. Consideration must be given to the cost of road development and maintenance, and whether that cost will be incurred by local, state R-9 or federal government. The relative availability of the funding for road costs should also be addressed. R-9

Water Quality
The analyses of each alternative's effect on water quality were also incomplete. First, contamination from Site E has the potential to contaminate a triple groundwater divide and a double surface divide. This was not adequately addressed nor a comparison made regarding similar impacts to water basins at the alternate sites. R-10

Second, Cedar Creek runs through the site and onto neighboring lands. The maps provided in the DEIS did not include Cedar Creek. This creek must be considered in the DEIS as it would certainly be impacted if Site E operations degraded surrounding water quality. R-11

And finally, DHES regulations require a 10 to 20-foot separation between the bottom of the landfill and the groundwater table. The DEIS assumes that "based on the hydrogeologic data for Site E...this requirement will be met," even though §4.2.1.2 of the DEIS acknowledged that the exact demarcation of the groundwater table at Site E is unknown. R-12

This reliance on existing hydrogeologic data is disturbing when read in concert with §3.3.2.1 of the DEIS. The latter section recognized that the stream flow rates used in the analysis may be severely underestimated. The DEIS went on to state that "(t)his order of magnitude difference in flows may illustrate a highly varying water table and flow conditions, or a least a strong connection between recent water recharge conditions and near-surface groundwater flow." Given this recognition, caution should be observed in placing a landfill on a site where groundwater levels are unknown and a direct connection with surface water flows probably exists. R-13

EPA has requested a six month extension for implementation of Subtitle D rules past the existing October 9, 1993 effective date. Until these rules are actually in effect, the DEIS should not rely on their effectiveness for protecting natural resources. R-14

Until the above issues are addressed and the criteria for weighing the alternatives set forth, MEIC cannot conclude that Site E is the most environmentally sound alternative available. We thank you for the extended opportunity to respond to the DEIS and look forward to reviewing the supplemental EIS. R-15

Sincerely,

Anne Hedges

Anne Hedges
Issues Specialist

JEA

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SOLID AND HAZARDOUS WASTE BUREAU

FACSIMILE COVER PAGE

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FAX NUMBER: (406) 587 6048
PHONE NUMBER: (406) 587 7587

DATE: 6/17/93

TO: JIM WILBUR

FAX NUMBER: 444-1499

FROM: JERRY ARBINI

COMMENTS: PLEASE FIND A COPY OF MY WRITTEN COMMENTS ON THE SITE E EIS. THIS IS THE SAME AS WAS SENT ON 5/17/93 @ 3:29 PM (PLEASE SEE INCLUDED FAX ACTIVITY REPORT).

PRIOR TO TRANSMISSION OF THE FAX, A CALL WAS PLACED TO YOUR OFFICE -- CONVERSATION WITH A SECRETARY -- VERIFYING A FAX AS AN ACCEPTABLE MODE OF RECEIVING COMMENTS. MY SECRETARY WAS DIRECTED TO SEND A HARD COPY, BY MAIL, BUT I DON'T BELIEVE IT WAS DONE.

I WOULD LIKE TO SEE THESE COMMENTS INCLUDED IN THE DOCUMENTATION ACCOMPANYING THE EIS.

THANKS,
JEA

NUMBER OF PAGES, INCLUDING COVER PAGE:

11 Hoffman #27 • Bozeman MT 59715

ACTIVITY REPORT

05/18/93 10:43
ID=THREE RIVERS

TOTAL TIME S=00:34' R=00:15'

DATE	TIME	S,R-TIME	DISTANT STATION ID	MODE	PAGES	RESULT	
05/13	13:24	00'52"	9165293605	ECM-S	01	OK	0000
05/13	14:26	00'45"	9165293605	ECM-S	01	OK	0000
05/13	15:22	00'25"		ECM-S	01	OK	0000
05/13	15:32	03'02"	9165293605	ECM-S	06	OK	0000
05/14	09:12	02'13"	708 916 4715	ECM-S	04	OK	0000
05/14	10:00	00'39"	9165293605	ECM-S	01	OK	0000
05/14	10:04	00'59"	9165293605	ECM-S	01	OK	0000
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05/14	12:18	01'40"	9165293605	ECM-R	03	OK	0000
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05/17	14:49	00'38"	JEA BOZEMAN	ECM-R	01	OK	0000
05/17	14:57	01'06"	12085294332	G3 -S	01	OK	0000
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SOLID AND HAZARDOUS WASTE BUREAU

TO: Department of Health & Environmental Sciences
Solid & Hazardous Waste Bureau
836 Front Street
Helena, MT 59601

FROM: Jerry Arbini
(With comments by Kathy Gallagher & Rick Hanson)

1. Page S-7, paragraph 1, line 1. "The facility is not currently in compliance with Subtitle D regulations - although a preliminary plan for expansion was developed in 1992, significant upgrades would be necessary to obtain the license."

COMMENT.

Landfill is currently licensed, does not require a new license. Landfill will not need to expand off the currently approved 60 acres. The present 60 acre area, using cut and fill with EPA approved ADC (alternative daily cover) site will have a life expectancy of 50+ years.* S-1

Page 2-6, last paragraph, 2nd sentence, makes reference to the fact that if Site E could be licensed, constructed and brought on line before October 9, 1993, it would not be required to meet the location requirements in Subpart B on the lines and leachate collection system requirements of Subpart D. Why is CCSS any different? S-2

2. General note - many times in report, authors refer to Ben Sale as Ben Sales, i.e. page 5-7, paragraph 2, first sentence. "Donna Tenneson recently sold this facility to Ben Sales Trucking.". S-3

3. Page S-13, S.5.4., last paragraph, last sentence. "The EIS estimates that approximately 2,000 to 4,000 tons per year of yard waste alone could be processed for composting." S-4

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*Based on the same volumes used to figure life expectancy of other sites.

COMMENT. The annual and seasonal volumes of yard waste are based on a starting volume of 40,000 tons per year. This figure is higher than EPA estimates for the population base available. Additionally the determinants of volume and quality of yard waste are climate, demographic, socio economic and land use characteristics of the area. Colder areas, similar to Helena, have not been as successful in composting programs. A review of different studies by the Congressional Office of Technology Assessment yielded a range of 0-40% volumes. A recent study of four communities in Missouri produced values of 1, 6, 10 & 19% by weight. S-4

Higher rates can be achieved through source separation. Does the current Helena Transfer Station and/or Site E plan on such a system? S-5

4. Page 1-3, section 1.2. Discussion of limited capacities and environmental problems with the City of Helena and scratch gravel landfills provide stimulus "to find, license and open a new facility."

COMMENT. S-6

This indicates there is no other option than opening a new site. Why not change this to "find, license and open a new facility or find a suitable alternative."

This would be the appropriate section to discuss the environmental problems associated with the two facilities. This seems to be an important factor that is mentioned but never discussed in depth. S-7

5. Page 2-1, section 2.1., second paragraph. "The Site E landfill Proponent (the City of Helena and Lewis & Clark County) has estimated that the 35,000 residents of Lewis & Clark County, which a new facility would service, would generate about 40,000 tons per year.

COMMENT. S-8

Using EPA figures of 4 lbs. per day, per person, the Damschen estimate is 55% higher than normal. (6.26 lbs.). The highest estimate was 5 lbs. per person in Montana studies making this figure still 25% high. Current estimates are exceedingly high.

Additionally, CCSS currently picks up the refuse outside the city limits of Helena and approximately 1/3 of the commercial refuse. With the raising of prices and closure of scratch gravel, all CCSS refuse will be taken by contract to the Ben Sale landfill thereby reducing volumes available for Site E.

Under recent Federal Court decisions "flow control ordinances" have been declared unlawful. Local authorities can not finance the construction and generation of municipal solid waste by requiring that all MSW (Municipal Solid Waste) within the authorities' jurisdiction must go to publically funded facilities.

With only a portion of the City of Helena waste and some self-haul county refuse available, the 40,000 tons per year is unrealistic. Totals of less than 20,000 tons per year should be figured. S-8

6. Page 2-24, part 2.1.5.4. Recycling and Composting.

No mention was given to the cost of processing recylables. If done on site or by a subcontractor, the overall cost should be considered. Recent studies from the National Solid Waste Management Association indicated that the cost to process one ton of recyclables was about $50.00 per ton. The average revenue from a ton of comingled recyclables is $25.00. It is clear that tipping fees or contractual provisions must be made to cover costs. S-9

Markets are not readily available in Montana and if markets remain weak, processing costs would increase.

This section of the EIS should be expanded to consider the cost or the benefits. If there is no market for glass, is it cost effective to consider recycling glass at this time? If glass is not recycled, what is the reduced volume?

7. Page 2-27, Section 2.2.1.1. Lines & Leachate Collection System. Use of concrete collection manholes.

COMMENT. Manholes are not used by many landfill designers and designers are no longer recommending their use. Riser pipes are preferred. Manholes are dangerous and a poor solution because they disturb the actual landfill due to differential settling between the manhole and the actual waste. This could be a design problem. S-10

8. Page 2-29, Chapter Two.

No mention is made of Explosive Gases Control. Most landfill planners are recommending passive systems in conjunction with active systems. The accumulation of methane in landfill structures can potentially result in fire and explosions that can endanger employees, users of the disposal site, and occupants of nearby structures, or cause damage to landfill containment structures.

S-11

9. Page 2-28, Section 2.2.3.

"Staffing would include a minimum of one full time employee."

Would one employee be able to do the required load checking, gate duties and cover "within 15 minutes of deposition?"

S-12

10. Page 2-29, Section 2.2.3.

"Wastes would be compacted to about 1,200 lbs. per cubic yard and contained within 15 minutes of deposition with six inches of daily cover."

Loads deposited by a 110 foot transfer trailer will take considerably longer than 15 minutes to cover. This is an unrealistic and unconventional way of operating. Typically the working face is covered at one time after it has been leveled and compacted totally. Trying to operate incrementally is inefficient and unsafe.

S-13

11. Page 2-29, Section 2.2.3. General Operations Continued.

"The collection manholes would be inspected weekly . . ."

COMMENTS.

See #8.

S-14

12. Page 2-29, Section 2.2.3, paragraph 4, 3rd sentence.

"Access would be limited to transfer trailers and other vehicles that haul directly to the landfill as authorized by County."

S-15

COMMENT.

Does this mean that county residents will not be allowed into the landfill, i.e. private autos, pickups, etc. S-15

13. Page 2-31, Section 2.2.6, Closure.

COMMENT. The closure plans for many Montana landfills do not address the requirement to place clay and membrane layers below the maximum depth of frost penetration to avoid freeze/thaw effects. Figure 6-2 of (USEPA 1989b) depicts 48" to 60" of freeze penetration. This indicates that the erosion layer will need to be thicker than the minimum requirements. S-16

14. Page 2-30, Section 2.2.5.

"Wastes would not be landfilled on windy days but stored at the transfer station."

COMMENT.

Typically loads on transfer trailers will average 16 tons in the winter and 22 tons during better weather. Will the plan provide adequate area and numbers of trailers to store wastes? S-17

15. Page 2-33, Section 2.4, 2nd paragraph. "The CCSS license does not include acceptance of the relatively large volumes of waste anticipated to be generated by the City of Helena and other applicable areas of Lewis & Clark County."

COMMENT.

The current license does not mention any volume limits for the CCSS site. The only limitations stated on the operating license are in accordance with the stated service area of a 35 mile radius centered in Helena. S-18

16. Page 2-34, Section 2.4.1. "There are no local zoning ordinances in force prohibiting the construction of a solid waste management system." S-19

COMMENT.

The emergency zoning of the CCSS site applies to the expansion of the landfill over the currently licensed 60 acres. This site, properly utilized, will provide enough area to dump refuse for 50+ years. At that time, if the zoning matter has not been resolved, the site could close. S-19

17. Page 2-35, Section 2.4.3. "The current monitoring program for the CCSS site is not in compliance with Subtitle D, but it would likely be upgraded. Wells would be sampled by qualified individuals, and analytical results compared against baseline data established prior to start-up in 1987."

COMMENT.

As stated in the text on page 2-35, the CCSS landfill currently has a monitoring network consisting of four (4) monitoring wells (three downgradient and one upgradient well). Three of the wells, MW-1, MW-2 and MW-3 are completed in the deep indurated tuff aquifer. The fourth, MW-4, is a shallow well in Quaternary gravels. MW-4 has always exhibited dry conditions. One additional downgradient well is planned for construction in June. This well will be completed in the upper portion of the indurated tuff aquifer. S-20

MW-1, 2 and 3 have been sampled since 1988 by Hydrometrics, Inc. of Helena, Montana. Hydrometrics is an approved firm by the MDHES Solid and Hazardous Waste Bureau (thereby constituting "qualified individuals"). Until recently, an abbreviated constituent list was sampled for at the site. However in January, 1993, the full State Table 1 list was analyzed for. Statistical analyses of data have not been conducted due to a limited database, however, they will be conducted in the future.

The monitoring program will be in compliance with applicable State and Federal regulations.

18. Page 2-37, Section 2.3.7. S-21

COMMENT.

This section needs to discuss how the composting materials will be developed. More importantly, how will the compostible materials be separated from the general waste stream. What will this cost be? S-21

Will the composting materials (2,000 to 4,000 TPY) be included in the total waste stream or be exempted from transfer station/landfill gate fees? S-22

Since the cost per ton is determined by dividing total operating costs by the number of tons paying, it becomes a budget consideration. Example: S-23

A change from 40,000 TPY to 36,000 TPY will change the cost per ton from $18.00-30.63 to $20.00-34.00 per ton.

Another consideration in composting is the amount of grass clippings. To date most composting projects have not been successful in attempts to compost grass clippings. S-24

19. Page 2-41, Section 2.4.2.

COMMENT.

How many days per year are the roads closed? Does the transfer station have adequate trailers and storage capabilities if the roads are closed. Note: Winter loads are considerably lighter than fair weather loads. Typically Yellowstone National Park Service/West Yellowstone Transfer Station see a drop from 22 tons per load to 16 tons. S-25

20. Page 2-41, Section 2.7.1.

COMMENT.

No mention was given to alternate proposals for mini-transfer stations. This proposal would not have required multi-million dollar transfer stations and would have been used with the Tenneson landfill. S-26

The addition of on-board scales to city refuse trucks would allow for better routing and truck allocation. This would offset any need for additional refuse vehicles to offset 5-10 mile drive to Ben Sale landfill. Remaining self-haul, city refuse would have been S-27 placed in large 10 yard or 30 yard bins and transported by City to Ben Sale landfill at a fraction of the cost of a large transfer station. S-27

Recycling, composting could be done by curb-side recycling or building of a MRF (Material Recovery Facility) on the Tenneson landfill site. S-28

Secondly, if the roads are closed because of cold weather limits, are adequate transfer trailers planned? S-29

Example:

110 tons per day @ 22 tons per load = 5 loads in fair weather
110 tons per day @ 16 tons per load = 6.87 loads in bad weather

21. Page 2-42, Section 2.7.2.

COMMENT.

If both landfills will require additional cover to offset freeze/thaw effects, will this come from the same area? If so, what are the increased costs, hauling numbers, etc? S-30

22. Chapter 3.0, 4.0.

COMMENT.

Soils: Permeability testing has been conducted at Site E and is scheduled for completion at CCSS by July, 1993. The range of values estimated for CCSS are very similar. There appears to be little difference in soil properties at either site. However, cover material at CCSS, poorly characterized at this time, may be somewhat sandier than Site E. S-31

Groundwater: Depths to groundwater are significantly shallower at Site E than those encountered at the CCSS site. The shallowest depth to water at Site E is reported at 25 feet in test boring E-1S, located in the northwestern portion of the site. Depths to groundwater range from 25 feet to 173 feet. Depths to groundwater at the CCSS site range from 165 feet in the lower lying western portions of thesite to 230 feet below ground in the southeast corner. The aquifers at both sites appear to be confined with static S-32 water levels ranging from 13 to 128 feet at Site E and 100 to 180 feet at the CCSS site. Hydraulic conductivity values calculated for various intervals in deep borings at Site E ranged from 4.1 x 10^-5 to 1 x 10^-4 cm/sec. Recent aquifer testing data at CCSS yielded similar values franging from 8.1 x 10^-5 to 1.4 x 10^-4 cm/sec. It is likely that the 100 feet of weathered clay material above the aquifer (which appears to be acting as a confining layer) will have significantly lower hydraulic conductivity. S-32

Given this information, we do not agree with the comment on page 4-13 which states "However, soils and underlying lithologies at the CCSS site are likely to have a lower capacity to inhibit the downward migration of leachate. In other words, if a leak were to develop in the liner system, leachate could migrate to the underlying groundwater resources faster than at Site A or Site E." Additionally, private wells are in much closer proximity to Site E than the CCSS site. S-33

Visual: The CCSS Site will present less of a visual impact than the Site E location. The CCSS is not visible from any golf courses or recreation areas and is nestled between a cement plant and a lead smelter. S-34

Discussion:

1. Table 4.12-1

Comment 1: To enable readers to figure annual O & M cost per ton, See Note 12, tonnage should be variable, i.e., if CCSS does not participate in Site E or Site A. What are costs at 20,000 TPY? S-35

Note 9. Leachate and gas management systems are required - why indicate a price without it? S-36

Where are the transfer station costs included? What is it going to cost per ton at the transfer station, i.e. self-haulers, county and city commercial. S-37

CCSS has given a price of $27.00 per ton regardless of volumes or contracts. Contract would provide city with certain cost increase quantities, etc. S-38

2. Table 4.12-2 - ESTIMATED CONSTRUCTION COSTS. S-39

Note 3. Estimates are considerably lower than EPA model guidelines. Why the variance in earthwork volumes? S-39

Additionally, the estimate of 80 acres and only 3 monitoring wells for Site E is quite conservative. S-40

23. Page 4-67, Section 4.12.3.1. S-41

COMMENT.

CCSS landfill will not need to expand, only upgrade to Subtitle D requirements.

New cost estimates of $27.00 per ton eliminate 2 year, 5 year, 10 year contracts. Site will be used regardless of Helena. Additional volumes will not decrease $27.00 per ton CCSS figure. S-42

24. Page 5-5, Section 5.5, second paragraph.

COMMENT.

The recently passed emergency zoning restrictions only apply on the expansion of the CCSS site off the currently approved 60 acres. The zoning ban would not need to be lifted to accept additional waste. S-43

Additionally, since CCSS's plans include exceeding Subtitle D requirements, the chances of contamination are much lower than those of sites E & A. S-44

The USGS study has identified the area in which the CCSS site is located as a Helena Valley aquifer recharge zone. However, the indurated tuff aquifer probably contributes a relatively small amount of recharge to the Helena Valley aquifer. Given the depth to groundwater and plans to upgrade the site to Subtitle D engineering specifications, we do not feel that this comment warrants significant concern. S-45

25. Page 5.5, Section 5.5. Alternate 4. S-46

COMMENT.

Couldn't this alternative be contractual or apply to any of the other alternatives. S-46

If it is, as maintained in other sections, to be included with expansion of existing landfills, the cost effectiveness of opening previously closed acres, addition of monitoring wells and remediation should be examined and figured. S-47

26. Page 5.6. "Department does not find any one alternative proposal site to be significantly superior" etc.

Alternative 4 is not an alternative but a policy statement which could apply to any site. S-48

The EIS should consider all, i.e. transfer station costs, and the fact that there is no need to site another landfill. If there is no significant difference, why add another site! S-49

While we feel that the CCSS site presents less risk to the area aquifers and certainly presents less visual impact that Site E, if each site is equal, then utilizing a private, established site is more in line with the Montana Solid Waste Management Act. This act, as stated on page S-7 of the EIS "encourages the use of private industry to the maximum extent possible in planning, designing, managing, constructing, operating, manufacturing, and marketing functions related to solid waste management systems". S-50

Additionally, since the CCSS Site is already licensed and in the process of upgrading to Subtitle D standards, and could conceivably handle approximatley 50 years of garbage on the currently licensed 60 acres, the development of an additional landfill in the region seems unreasonable. The Cit of Helena and Lewis and Clark County have less than a favorable track record with respect to previous Helena area landfills environmental issues (namely, groundwater pollution). S-51

27. Table 5.1-1

This table shows relatively few differences between each site. S-52

Jerry Arbini

BEFORE THE DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES

OF THE STATE OF MONTANA

* * * * * * * * * * * * * * *

In the matter of the Draft Environmental Impact)
Statement conducted by the Department of Health)
and Environmental Sciences, Solid and Hazardous)
Waste Bureau, on the Application by the County)
of Lewis and Clark for a Class II Sanitary)
Landfill)

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TRANSCRIPT OF HEARING

May 17, 1993
Helena, Montana

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BEFORE THE DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES

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TRANSCRIPT
OF
HEARING

* * * * * * * * * * * * * *

The above-entitled matter came on for hearing before the Department of Health and Environmental Sciences beginning at 7:05 p.m. Monday, May 17, 1993, in C209 Conference Room of the Cogswell Building at 1400 Broadway, Helena, Montana.

Proceedings of the hearing were reduced to writing, to-wit: shorthand, and were also recorded on a tape recording machine by Betty Dean, Hearings Reporter. Here follows a complete transcript of the proceedings and of the hearing and all testimony adduced thereat.

Hearings Officer Presiding:

MARK STALEY, Attorney at Law
Solid and Hazardous Waste Bureau
Department of Health and Environmental Sciences
Cogswell Building
Helena, Montana 59620

The following proceedings were have:

OPENING STATEMENT BY MARK STALEY

The draft EIS is prepared in response to an application submitted by Lewis and Clark County for the licensure of a proposed landfill site. My name is Mark Staley. I am an attorney for the Department of Health and Environmental Sciences, and I have been appointed Hearings Officer for tonight's hearing. Before we get going, I want to briefly go over the purpose and the procedure for tonight's hearing. A little background: In March of 1990, the County of Lewis and Clark submitted an application to the Department for licensure of a municipal solid waste landfill. In response to that application and as a part of its duties under the Montana Environmental Policy Act and the rules implementing that act, the Department prepared an environmental assessment. After receiving public comment on that assessment, the Department determined that an Environmental Impact Statement was necessary in order to properly evaluate all the impacts of the proposal. The Department has now prepared a Draft Environmental Impact Statement and has released it for public comment. The purpose of tonight's public hearing is simply that: to accept public comment on the Draft EIS. Interested parties may also submit written comment to the Department through May 24, 1993. The Department will accept for inclusion into the record any comments postmarked by midnight on May 24th or actually received by the Department by 5:00 p.m. that day.

I want to begin by asking anybody who wishes to present testimony tonight to fill out one of these forms we have provided that indicates your name and address and any affiliation. Additional forms are available in the back of the room. Is there anybody that has one of those forms filled out that hasn't given it to me yet?

The procedure for tonight's hearing -- this is an investigative hearing. It's not adversarial in nature. As such, the rules of court or evidence do not apply to the hearing. Under the rules no person is allowed to give testimony on behalf of the

Department. However, Department personnel are here tonight and will be available after the hearing for questions or discussion. When I call your name, I'll have you come up and sit in this chair here and speak into the microphones. We are making a record of tonight's hearing. I will ask you to present whatever evidence, testimony or information you may have as expeditiously as possible. Please indicate your name and address and affiliation at the beginning of your testimony. We have quite a few people who wish to testify tonight, so I am going to ask you to keep your comments as brief as possible. Try and limit them -- if something has already been touched -- if an issue has already been touched upon by someone else, please try to stay away from that issue or keep it very brief. I'd like to allow, oh, somewhere around 10 minutes for each person to testify. That way we make sure that everybody can have their say tonight and other people who want to testify aren't infringed upon. That concludes my introductory remarks, so now we'll begin taking testimony and we'll start by hearing from Richard Nisbet.

STATEMENT OF MR. RICHARD NISBET

Mr. Chairman, mine will be very brief. I was here primarily to respond to questions that may come up affecting the City of Helena, so I don't have a prepared statement. I am more of a resource in case issues come up at a later time. T-1

Mr. Staley: Thank you. Thomas Morrison.

STATEMENT OF MR. THOMAS MORRISON

Initially, I would like to say that the remarks that I make are not intended to be personal to any individual, particularly those people who are burdened with the decisionmaking, of having to T-2

make the hard decisions that are involved here, and so please don't
misunderstand my remarks, because they are going to be fairly T-2
straight forward.

The first thing I would like to say about the EIS is that it
reflects a huge cost credibility gap, and mainly because it is so
dependent upon statistical data that has been fed to the people
that prepared the EIS. I have to commend them for their
thoroughness as much as they could be with the information that T-3
they were provided and as much as the county was willing to pay for
it. The sad truth is that there is a lot of missing data that
wasn't there because the people who paid for the EIS didn't want to
provide that information. And this credibility gap isn't new to
the county. We found that initially there was a $40,000
preliminary landfill design plan. My understanding is that it has
not escalated to $240,000. Another example of the same kind of T-4
speculative data was that the transfer station was originally going
to cost $800,000. Damschen & Associates later then projected that
it would be a million and a quarter and now the county and city are
planning on building a $2.76 million dollar transfer station. Now,
if I have had 22 years experience as an IRS trial attorney, and if
a taxpayer were to walk up to me when I was working with the IRS
and I would have asked him "What was your income last year?" and
the taxpayer were to say to me "Well, I'm not sure whether it was
$420,000 or whether it was $825,000," what do you think I'd say? T-5
And yet that's exactly the statement that appears in the EIS when
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$825,000 a year." And yet we're supposed to depend on this

T-5

document in order to make it possible for us to make a good environmental impact decision. I don't think that that is the kind of data we need to rely on to make the right kind of decision.

T-6

There are some other things that I think that are missing--special environmental issues in terms of the economic factors that are attributable to Site E. The first one is what I call the Cloverview Factor. And that is, out at Fox Ridge golf course, we have a wonderful development opportunity for people to develop the same high quality expensive homes that appear around Cloverview right near the municipal golf course. And those expensive homes generate huge revenues that we can depend upon to help bear the costs of running our county government. I really don't think the real local revenue loss to the county is adequately measured in the EIS.

T-7

The second factor that I think is unique -- this idea that is missing -- is the theft factor. The theft factor relies on an old principle called "Thou shalt not steal" and it is found in the United States Constitution that entitles American citizens, wherever they live, to just compensation from their government for whatever occurs because government has wrongfully taken their property. We have one member here in the room that has 320 acres, a one-mile boundary, that goes around the proposed Site E landfill. His property is wonderfully potential property for subdivision development someday near the Fox Ridge golf course. The County hasn't figures on any kind of compensation to him. If the landfill goes out there, you can be assured that whatever value he has in his property, that value will not be there the minute they build the golf course, and I don't think anybody has thought about seeking an expert legal opinion as to what his right of recovery

T-7

would be, but I would think that county residents would be pretty sad to think that we're uncaring enough to let this person suffer huge economic loss and would not want to see him adequately compensated.

T-8

The third factor that I think is unique to Site E and perhaps any kind of county-operated, government-operated landfill, is what I call the Scratchgravel Factor. I think in this day and age that running landfills, as indicated by the EIS, is becoming so technically difficult that it's not any more--it would be almost no more ambitious for the county to think that it had the expertise to run a new Subtitle D-like landfill anymore than to build its own computers instead of buy them from IBM. I don't really see, and perhaps that isn't a quantifiable cost, but I think it's a real cost. We've already seen that with the Scratchgravel operation. Private entrepreneurs are accountable and they can be made to pay when they screw up, but not county governments, just another group of people will get elected into office on the failures of those who screwed up, but that's it.

T-9

Using the EIS's own figures, it appears possible that hauling Lewis and Clark County's trash to Great Falls, based on a quantifiable factor, the actual contracting cost that the City of Helena has entered into with Great Falls, a private entrepreneur in Great Falls, it appears that it's possible that hauling Lewis and Clark County total trash to Great Falls might be less than the projected annual operating costs of the EIS without considering one penny of start-up costs. When you add $9 million of start-up costs on top of that, it might be that trying to operate the Site E landfill might be double or triple what it would cost to haul all our trash all the way to Great Falls. Certainly there has got to be some other alternatives and we are entitled, the voters of this County, are entitled to know what the real figures are.

T-10 I was thinking about the remarks I was going to make and I was trying to think about why was there such a strong uprising in the last election for Ross Perot, and I think it's because people are fed up, they're untrusting of the people that are government officials, and I think that's too bad, but this EIS should be based on credible data and it's not.

T-11 Similarly, saying it another way, the EIS says that hauling trash to Great Falls would cost from $46.75 to $53.70. I think that's just tipping: that doesn't include hauling, and we have seen a contract where the trash dumping in Great Falls is $15.00 a ton and the hauling is another $10.00 a ton. Surely that kind of a data gap isn't what this EIS should be based on.

T-12 I talked to numerous people when the Helena "Record" showed the contrasting costs of $9 million, potentially $9 million, just to start Site E. It doesn't put any trash in the ground. It doesn't pay any of the projected $825,000 annual maintenance and operating costs. In addition to that, there is a $9 million start up cost.

I don't think that the County Commissioners have courage enough to put up before a bond issue, with the voters of the county, and say,

T-13 "Hey, you've got a choice. You've got $9 million dollars we can raise by bonds to start the Site E landfill, or we can use some of these other alternatives that were mentioned, one of which was only $170,000 in start-up costs." You know everybody I talked to about that newspaper article said to me they don't believe it. The newspaper must have made a mistake. They dropped a couple of zeros off the number, because that can't be a true figure. And yet if they'd have looked at the EIS, that's the figure that you can see: $170,000 up-front capital cost to go to a private source for trash disposition versus $9 million to operate our own trash. If you put that vote up and the county voters, the taxpayers, knew what they were voting on, I can't believe that they would say "Let's go ahead and spend the $9 million." I think my time has probably run out, so I will not say anything further, but I thank you for your time.

T-13

Mr. Staley: Thank you. Before you leave could you please state your name and address?

Mr. Morrison: You bet. My name is Thomas E. Morrison. I am presently in private practice. I am a tax attorney here in Helena, and my address is 5420 York Route, that's my personal address. I have an office in Helena here on Last Chance Gulch. Thank you.

Mr. Staley: Thank you. Terry Clausen.

STATEMENT OF TERRY CLAUSEN

Hi. My name is Terry Clausen, and I live at 5545 Kerr Road, and I have a cold, so bear with me. After a review of the Draft EIS, I have limited my disappointment with the scope of the document to what I think are three important points. First, I had hoped to read an impartial, objective comparison between all the sites and all the alternatives. I was disappointed by the lack of new research in the EIS and of cost comparisons. Aside from one test well at Site A, all the incomplete, and now outdated, research from the Environmental Assessment was simply regurgitated for the EIS.

T-14

Second, on nearly every page of the EIS, the Subtitle D regulations are referred to. The majority of all conclusions endorsing Site E are based on compliance with Subtitle D regulations. Currently, it appears that these regulations won't be

T-15

required for another 2 years. Does that mean a proposed new landfill at Site E won't be required to operate under these new guidelines? I don't know that: I would like to know the answer to T-15

that. The application currently doesn't incorporate any of the safer technologies soon to be required under Subtitle D regulations, and it just makes me wonder: Doesn't anyone want to build or operate or license a safer landfill than we have at T-16

Scratchgravel? My third point is that since no permanent engineering solution has been found to isolate leachate completely from the groundwater the threat to our aquifer has not been properly addressed in the EIS. The applicant's engineering consultant's theory was that the northwest corner of the site is a recharge area with groundwater moving under the site to the west, south and southeast directions. It seems like hardly a low-impact T-17

area to contaminate. On a more emotional, rather than intellectual level, I was recently struck by an essay I read by Wendell Barry. Mr. Barry was attending a meeting regarding the licensing of a nuclear power plant in his home state, but much of what he said rang true for me, and I am quoting now from him. "The meeting proceeded as such meetings typically proceed. The fears, objections, questions and complaints of the local people were met with technical jargon and with bland assurances that the chance of a catastrophe was small. In such a confrontation, the official assumption apparently is that those who speak most incomprehensively and dispassionately are right and that those who speak plainly and with feeling are wrong. Local allegiances, personal loyalties, and private fears are not scientifically respectable. They do not weigh at all against objective T-18 consideration of the facts, even though some of the facts may be highly speculative or even false. Indeed in the history of such confrontations, the victories have mainly gone to the objective considerers of the so-called facts. Everywhere, everyday local life is being discomfited, disrupted, endangered or destroyed by powerful people who live, or who are privileged to think they live, beyond the bad effects of their bad work." And that's the end of my comments, and I just hope you will look for conclusive answers to the questions that are still in the EIS.

T-18

Mr. Staley: Thank you. (Applause) Jeff Clausen?

STATEMENT BY JEFF CLAUSEN

My name is Jeff Clausen. I live at 5545 Kerr Road in Helena. I think that the EIS has a major flaw in that it was written under the assumption that the Subtitle D regulations would be in effect and that assumption is wrong. The new regulations are not in effect now and they won't be when a license is granted unless there is some unforeseen extension. And the application is not for a Subtitle D landfill, and it's not what this community is going to get. We won't get all the glorious state-of-the-art environmental safeguards that the EIS goes to great length to spell out. Because of this the comparison of the Environmental Impacts is really incomplete, especially concerning the high risk of potential groundwater contamination. You must put values on this risk at each site. We know how many of the substandard landfills leak, and this groundwater is what you people are supposed to be protecting. Please examine the potential impact in relation to what already exists at each site. At Site A there is already several sources of potential groundwater contamination in the area. There's the

T-19

T-20

T-21

smelter, there's the old City of East Helena landfill within one mile directly downstream from Site A, and there's also the East Helena sewage lagoon within two miles of Site A. Then if you look at the City-County sanitation services site, there's already the potential of a groundwater-contamination problem because it's an unlined landfill. Then if you look at Site E, it's across the valley, it's in a pristine groundwater environment. There's no industrial potential contamination around that area. It's on top of a hydrologic divide, and there's potential contamination of two watersheds, not just one. Each of the watersheds has wells on it and then they both are in close proximity to two major water bodies. Another leachate plume should be one of the major environmental considerations, and that is not addressed in the EIS.

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I also have concerns about the cost comparisons. I think they're totally inadequate. We still don't have cost figures on the design at Site E, and there is a history, as Tom pointed out, of gross

T-22

underestimates of what things are going to cost. Also, I noticed in the EIS that the operation-maintenance costs on Site E were compared with Site A exactly the same--$420,000 to $825,000. But in the cost analysis summary in the Phase 2 Site Study those costs weren't the same. For Site E, it was $430,000 and for Site A it was $417,000. There's no explanation of why those cost figures are the same now when there was discrepancy in the siting study.

T-23

On transportation, you summarily dismiss hauling out of the area based on the cost of the distant transportation, but you fail to recognize that the cost of transportation to Site E will be twice what they are to Site A, and they will be considerably greater to Site E than they would be to the CCSS site. The EIS

T-24

also fails to consider alternatives on a regional scale. The new regulations would make. if they ever get implemented, will make regional landfills the only viable alternative someday, and you should be considering the geographical centers of the garbage on a regional basis. And in our area you should be looking at Jefferson County's garbage, and Broadwater County's garbage and potentially garbage from northern Lewis and Clark County and perhaps even White Sulphur Springs. And the transportation routes to each of the T-25

sites should be examined. because there is going to be significant impacts of transporting garbage on a region-wide basis to each of these different sites. Also, the EIS admits to the possibility of strong odor and litter as being two impacts. but nowhere does it compare these negative impacts on the surrounding area based on the prevailing winds. Somewhere you need to combine like a wind rows, or some measure of the wind in the area, with a map showing the number of residences and recreational uses that will be downwind, and then you need to rate those impacts for each of the three T-26

alternate sites. Alternatives also fail to consider the possible expansion of Site A into Jefferson County. Definitely there is more likely possibility under the new regulations of Jefferson County needing a landfill site too and they might be very amenable to having a landfill that could be a potential place for their garbage as well. Also, the population is increasing in that part T-27

of the County, so it's a likely area to consider. Let's see, I also disagree with the EIS's conclusions about the traffic impacts on York Road. I know that it has been studied and statistically analyzed, but I still think, from a common sense standpoint, it is narrow by today's highway standards, it's lined with residential T-28 development almost the entire way, it's the only corridor to several residential communities, including Lakeside and York, and I just think it's a poor route for semi-truck traffic. That's all the oral comments I have prepared for now. Thank you. T-28

Mr. Staley: Thank you. Mona Jamison.

STATEMENT OF MONA JAMISON

For the record, my name is Mona Jamison, and I'm the attorney retained by a number of individuals out by Lake Helena who we commonly refer to when you hear referred to as Citizens for Responsible Landfill. Now, as can be expected, my comments will take longer than ten minutes; however, many of our people have deferred their time to me and have retained me in order to be their voice on this EIS matter. I would ask your indulgence, but I would assure you that I will speak as quickly as possible and for those of you who know me, you know I'll stick to that word.

T-29 I'd like to begin by first stating that I believe the EIS, the draft, is deficient and inadequate, and I'll now go through a number of the reasons. I plan on submitting written comments. I am hoping you will provide a couple more weeks at least in order to get that task done. The document is long; it is approximately 300 pages, there are lots of relevant papers and documents in your own files that need to be reviewed and compared against the draft EIS. T-30 To begin with, I believe the scope of the draft itself is inadequate. When the operation plan and license application for Class II sanitary landfill at Site E was submitted to the Department in March 1990, it was submitted for a 320-acre site, 189 of those acres which would eventually be used for solid waste disposal. The application is clear on the size of the landfill.

Page 1 of the application, and I have Xeroxed a number of pages. not the entire application, say "The actual area to be landfilled is approximately 189 acres." Go back to a chart, a checklist chart, that's also contained in the application and again it says: "Acreage usable for the solid waste system, 189 acres." Surprisingly, the Draft EIS only evaluates the environmental impacts of 80 acres and not the full 320 acres applied for, nor the 189 intended for landfilling purposes. Yet, on page 2-18 of the Draft EIS it states itself, within the document, that the proposed action is for 320 acres having a 91-year life. The draft is deficient on this point. People familiar with MEPA law, I am sure. would concur. Also, on page 2-12, which is entitled "Summary of Site Data, Phase II Siting Study" that also describes Site E as having 180 usable acres. This deficiency, on its face, renders this document inadequate and out of compliance with MEPA. T-30

The fact that the Scratchgravel landfill district manager, on March 17, 1993, but 3 or 4 weeks ago, and three years after this application was submitted and probably after the first draft of the document was submitted to the Department of Health sends a clarification letter to Mr. Dillard stating that the solid waste application submitted by the County is to apply to Phase I of the project only. Of course, I am quite curious how and why this letter found itself into the files stating this clarification as we near publication of the draft document. I am hopeful and confident that in future we will find out why. T-31

However, the MEPA and DHES MEPA rules require that EIS's be prepared on proposals for project and I put that in quote. The County's proposal is for Class II Sanitary Landfill at T-32 the 320-acre site E, 189 acres of which will be used for

T-33

landfilling. This March 17th letter cannot, submitted three years after the application, after expenditure of taxpayer funds for a draft document, redesign the application to suit after the fact the information contained in this document. It is a glaring defect. Every aspect of the analysis for Site E, including those aspects contained in Chapter 3 entitled "Affected Document", entitled "Affected Environment" must be redone. Needless to say, the socio-economic and costs must also be redone to reflect the impacts on the entirety of Site E. I would direct your attention to Table 4.12-1, 4.12-2, and ultimately Table 5.1-1. They must be revised to reflect the analysis for the entire site. If we go to Table 4-12, and I thought I had a sticky in there and I guess I didn't, or it came out, well-laid plans, the "Estimated Construction and Operation Cost Summary" in 1990 dollars. For all of the sites, including Site E, not surprisingly now, is for 80 acres. When we go to the back where the "Comparison of Alternatives" exists, and the Department's Preferred Alternative is set forth, we also have that Table 5.1-1. Again, talking about the total cost in summary for the "80-acre Site E, Phase I."

T-34

Now, I would ask you to observe that the Site E and Site A costs end up being comparable--$6.2 million to $9.7 for Site E, $6.2 million to $9.8 million for Site A. Notably, Site A is also listed as 80 acres. Obviously, a non-accountant, non-tax attorney, sites here and says "If we multiply that to the 189 acres, is the real cost of the project between $18 million and $27 million?" The application was for 320 acres, 189 to be landfilled. All aspects, all impacts, must be directed to what the application and the proposal for the project was, including the costs. And as astronomical as the $9 million may be, and in light of Mr. Morrison's testimony. I can assure you that it's even more astounding when it's $18 to $27 million.

T-34

The failure, excuse me one moment. the failure of the draft to even deal with the remaining landfilling 109 acres, which is Phase 2 and Phase 3, as cumulative impacts of Phase 1 further places the draft out of compliance. ARM 16.2.32B of your MEPA rules. and case law, require that the draft contain an analysis of the cumulative impacts resulting from the proposed action. Those impacts include all of the impacts listed in the Affected Environment. Now it's my position, as a matter of law, that this document should have been done on the entire application as submitted. What I find shocking is not only wasn't the analysis done on the application, but the cumulative impacts don't even reflect those resulting on Phase 2 and 3 from Phase 1.

T-35

The draft states in many places that only a preliminary design for Site E has been submitted to the state by the county. The EIS should evaluate the final design as mentioned above for compliance with Subtitle D and other applicable rules.

T-36

Has the final design of Site E been awarded? We notice that in the newspaper, I believe it was March 7th and March 25th. proposal for bid to do a final design plan for Subtitle D compliance was noticed in the newspaper. Has that been awarded? To whom? For how much of a fee? And has that fee been included in the costs associated with the development of Site E and that the taxpayers will inevitably be asked to pay?

T-37

Also when Lewis and Clark, when the County at no fault of their own, submitted its operation plan application in March 1990, federal regulations applicable to landfill sites had not yet been promulgated which we know is Subtitle D 40 CFR Part 258. Although these regulations will not

T-38

become effective until October 9, 1993, and now there is some discussion that there will be delay at some time in the future, they will apply to and affect all aspects of Site E. When the County submitted its application, its preliminary design was submitted in response to present existing solid waste regulations. New and existing landfills, however, including Site E will have to comply with the requirements of Subtitle D. When Lewis and Clark County submits its final design and operation plans for Site E, as it has advertised, it will have to demonstrate compliance with the Department. Table 2.1.1 in the draft, entitled "Summary and Comparison of Solid Waste Regulations" which sets forth the differences between the current solid waste regs and the Subtitle D for various compliance aspects, demonstrates some of the differences existing between the regulations as to landfilling requirements. The differences are distinct and costly. T-38

In response to the failure of the county to have submitted for justifiable reasons but nevertheless legitimate ones, a design plan that complies with Subtitle D and failure of this document to address the application applied for acreage, I am hereby requesting that pursuant to ARM 16.2.638, 636, DHES's own MEPA rule, entitled "Supplements to Environmental Impact Statements" that DHES prepare a supplement to this draft before the final EIS is issued for, among other reasons, quoting from the rule "There are significant new circumstances discovered prior to final agency action, including information bearing on the proposed action or its impact" that changes the basis of the decision. That's only one aspect of the rule justifying and compelling preparation of a supplement. I can assure you that if you review the others there are many which T-39 would compel that a supplement be prepared. The draft must comprehensively evaluate a final design plan in accordance with Subtitle D. I'd like to make a few comments on socio-economics and costs and speak a little faster. T-39

Mr. Staley: Thank you.

This part of the draft, I believe, is also totally deficient. Point 632 of your own MEPA rules require that the draft contain a description of the impacts of the quality of the human environment of the proposed action including, but not limited to, the economic and environmental benefits and costs of the proposed action. Interestingly, in a letter of July 30, 1992, from your consultant to Mr. Dillard, describing the content requirements of the draft, the consultant points out and recognizes, after reviewing the entire record, the public concern and request for a thorough economic and socio-economic analysis of the proposal. He asks, on page 15 of that letter, for direction on how you, the Department, would like to handle this analysis. Significantly, comments that I handed in also on July 13, 1991, stress the importance of these citizens to the MEPA requirements for a thorough economic analysis and also raised the issues of costs related to Subtitle D. After a search of DHES files, I admit I could have missed a page, I could not find any written guidance to the consultant on this issue. T-40 Is there verbal guidance? What was the guidance? If no guidance was given, why not? The draft fails to address the scoping comments which MEPA and the MEPA rules require be addressed in the draft. How were the costs for siting computed? Did the consultant just fabricate these or were they supplied by the County? There is absolutely no cost projection breakdown that can be found in the T-41

T-41

draft or the DHES files. We request that this specific documentation be provided. I will be providing at the time of submission of comments state-of-the-art landfill cost projection structure so that this can be considered by, I hope, finally the County and ultimately the Department.

T-42

Bottom line: What will the tipping fee be per ton for residential and commercial use at Site E? The citizens have a right to know, and EISs are considered documents of disclosure. The reason we feel the Department must be diligent about getting this information from the County, I will not repeat, are the cost increases associated with the transfer station. We believe that the County presents the figures necessary to "sell the project", then after it's locked up, lock, stock and barrel, behold--the fees increase. It either represents poor preliminary research before the design or it represents a failure to disclose to the public what they have a right to know.

T-43

I will also present letters between an attorney in Helena, Mr. Frank Crowley, and Mr. Bob Johnson, where Mr. Johnson had had a discussion with him and indicated that he would be working with Mr. Damschen on establishing a cost summary covering the various costs for Site E. To this date, unless that has been prepared and submitted, I have not received a copy nor been notified that that has been done. That's critical because that's a statement on its face and knowledge by the County that they know the costs are insufficient and inadequate. I urge you to please get those figures, and as an alert to the public officials present tonight, if the figures ultimately differ from what is finally provided and published in this document, I can assure you the public will be heard on that matter.

Skipping some things that I will put into the written comments, I would like to make a couple of comments on the alternative site analysis. That is inadequate. A reasoned choice must be presented and a comparable site analysis, and a competent

T-44

analysis of the alternatives must be provided. Interestingly, your consultant in that same letter of July 30, 1992, informed Mr. Dillard that more site-specific data is required in order to provide the comparable evaluation of Site A or Site B in the draft. The letter suggests that two additional wells should be drilled on Site B and three on Site A. Ultimately, none were drilled on B and one on Site A. The static gap still exists and the three recommended by the consultant in order, at Site A, to perform the required alternative site analysis has not been done. Further, the

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Solid Waste Act itself stresses privatization. The analysis of privatization, I don't believe, is adequate in this document. Two things need to be discussed further regarding privatization. One

T-46

is Great Falls. I was stunned to read in the newspaper that the shipping, the tipping and hauling charge would be $25.00 per ton. That is in direct conflict with the information set forth in this document. I will provide the page number in my written comments. Why that disparity? Is the City of Great Falls willing to take that tonnage, that waste, from the City of Helena and Lewis and Clark County at $25.00 per ton in the future? If so, for how long? Even now, with only Phase 1 costs computed in this draft document, the ranges still hit $30 per ton. Already, it may be that this last-minute backstop hauling to Great Falls is a cheaper alternative than the proposal. And no additional land has to be disturbed which is another critical aspect in terms of weighing the

T-47

environmental impacts. Further, there was some discussion of CCSS, now known as the Ben Sales alternative, in the draft. There was a statement in the summary section saying that that particular site will have the least change of impact because it was already existing--a fair recognition of environmental impact. Yet, in Chapter 5, which goes through a comparison of the alternatives and the agency's preferred alternative, there is absolutely no discussion of that significant non-impact in that choice. I believe again that that is inadequate. My comments will point it out further. T-48

Further, it was mentioned that Mr. Sales had not prepared or submitted any preliminary landfill design to the Department for review, therefore, it limited the consultant's review of the alternatives. But, a couple of weeks ago, that information came in and I would submit to you that under law you are now required to consider that. There is a Montana case, Federal District court, but nevertheless Montana-based, that says "This is the essence of the requirement to consider all alternatives, not just those within the particular agency's jurisdiction." The Court sympathizes with the fact that some of the necessary information was not available to the core at the time EIS Supplement 1, I underscore Supplement 1, was compiled. Nonetheless, an agency is under an obligation to reassess a project as more information becomes available, and since that information for an identified alternative has become available, I would urge you to extend that study. T-49

I will skip cumulative impacts, save that for written comments, and I would like my closing comments to be directed toward the preferred alternative. The draft states that since the proposed action meets all of the current licensing requirements the Department's proposed decision is to grant the license and declares in Chapter 5 that the preferred alternative, therefore, is Site E. That's not what MEPA is about. What MEPA is about is what is the most environmentally-sound decision after analysis of all the impacts. By tying the preferred alternative to licensing requirements and the ability of Site E or any other site to those requirements, totally destroys the purpose of MEPA. MEPA is a document of disclosure. Which alternative has the least impacts? And the most remediable impact is the one that is supposed to be the preferred alternative. If DHES chooses to license Site E in light of a different preferred alternative because it believes that MEPA is procedural, rather than substantive, that is one issue. But to impose that interpretation of MEPA on the development of the preferred alternative is not justified by the MEPA Act, your own rules, or any case out of this jurisdiction. The best licensing alternative is not the best environmental alternative, and I would suggest to you that your very own document, which cites the Ben Sales site as having the least impact of change, the Great Falls alternative, which you have not explored, and I would submit that you should because now it is the cheapest and again the impacts are already felt, must be considered as you develop your preferred alternative. The best licensed alternative is not what MEPA is about. I would ask you to consider these comments and the comments that I'll be submitting in writing. A part of me is hoping, of course, that you will not remedy this document. By failing to do that, you will just make it easier to file a claim in court.

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However, being more interested in good governance and in the proper implementation of the Montana Environmental Policy Act, I would ask you to do the supplement, get the costs, the real costs. Wait until you get the costs before you even proceed to do that document and then enter into the proper environmental analysis as you choose your preferred alternative. Thank you very much and I appreciate your indulgence. T-53

Mr. Staley: Thank you. (Applause) I would like to remind everybody to keep your comments as brief as possible. The next person will be Blake Wordal.

STATEMENT OF BLAKE WORDAL

For the record, I'm Blake Wordal. Lewis and Clark County Commissioner. Tonight I am representing Lewis and Clark County and commenting on our proposed landfill, also known as Site E. We have reviewed the draft EIS and, not surprisingly, support the finding that the site should be licensed by the State. The Draft EIS states what we have maintained since submitting our application: that Site E is an environmentally-sound site for a landfill. The County fully intends to construct a landfill which meets all of the requirements of Subtitle D, even though those requirements are not yet in force, and there is considerable question when those requirements will actually go into effect. T-54 We agree with the recommendations contained in the Draft EIS regarding the importance of recycling and composting solid waste. Both the County and the City of Helena have instituted recycling programs and we plan to continue and to strengthen those programs with the operation of both the landfill and the transfer station. In addition, we are working with the city to develop a composting operation as part of T-55 our overall solid waste program. Finally. I want to comment about the process. The very first meeting I attended as an elected official concerned the planning for a joint City-County landfill in 1983. Ten years ago we believed that it was in the best interests of both the County and the City to join together and to plan for the future of solid-waste disposal in our area. During that time we investigated many sites for a future landfill. We evaluated each of them and made a public policy decision to attempt to license Site E because of its environmental and economic advantages. Every step of this process involved broad citizen participation. The Draft EIS validates all of the work and the decisions which were made several years ago. Technologies have changed and requirements for landfills have become necessarily stricter.

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Also, during those ten years, costs have soared to comply with those technologies and requirements. With each passing year, the cost of disposing solid waste escalates for the citizens of Lewis and Clark County and the City of Helena. As you know, the city will close its landfill and transport waste to Great Falls this summer because Site E is not yet licensed. Transporting waste to Great Falls will cost the city ratepayers an additional $30,000 per month over what disposal at Site E would involve.

T-57

The debate over where the landfill should or should not be located has raged for at least 10 years. There must be an end to this process. The costs are simply too high for this debate to continue. We encourage to accept the determination of the Draft EIS and license Site E without any further delay. We reserve the right to respond to the comments you receive tonight and during the written comment period. Thank you.

T-58

Mr. Staley: Thank you. Roger Sandiland?

STATEMENT OF ROGER SANDILAND

Mr. Staley, thank you for your time. In lieu of the limitations and time frame we are working under, I will limit my comments mainly to the roads and transportation section of the Draft EIS. The first paragraph under Section 3.9 states that no other transportation mode, such as rail, etc., etc., are very likely to be used or a viable alternative for Site A or the City-County Sanitation Landfill site. This statement, on its face, is pretty strange seeing that many communities, for example, Portland and Seattle, right now use rail as their modes of transporting waste out of the city. Advantages of rail transportation vs. trucks: Right now, rail routes from the site, the transfer site, not to the proposed Site E but to City-County Landfill or Site A, already have rail lines right to them and could be used. Rail site could provide alternative on-site storage for windy days, drifted-snow days, and allow more than two days of storage as the transfer station now provides. Rail connection at the transfer station could also be used for transportation of recyclable materials. I haven't had a chance to read this entire document nor have I had a chance to read the application for the present transfer station, and I don't know if the present transfer station allows for rail transportation of recyclable materials. This definitely should be looked at as an alternative. Using rail eliminates the need to buy and maintain a fleet of trucks as is proposed under the application. Using rail traffic reduces pollution and noise impacts in non-industrial areas. Rail traffic is not as vulnerable to fuel cost fluctuations as we're dealing with a large corporation

T-59

and trains. Rail traffic would reduce congestion at intersections and rail traffic is safer and less vulnerable to accidents along the route. T-59

The EIS baseline study does not address the following issues in the transportation and routes. The haul distances to Site E is approximately two miles longer than Site A or City-County Sanitation Landfill. This calculates in 40,000 tons per year times two trips a day or 80,000 ton miles additional costs for the life of the landfill that are not included in the cost analysis of Site E. T-60

A factor that we all need to be concerned with when we talk about haul routes is the jurisdiction of the routes that are proposed in the EIS and who has to maintain and pay for the routes that will be used. For example, the Site A haul routes from Benton Avenue to Smelter Road and the haul route out to City-County landfill are on almost 100% Federal funded roads for construction and maintenance. To Site E, the Benton Avenue and Custer Avenue routes are in Federal Aid Urban System and they have to compete with other Federal Aid Urban System routes for limited funding. York Route, the primary route for Site E, and the routes the trucks will take there is a secondary highway and requires County funding totally. In other words, the taxpayers of this County will fund all maintenance, snow removal and rebuilding of York Road if this road is impacted by Site E in hauling our garbage to it. T-61

The pavement design on the various haul routes were not discussed or analyzed in the EIS. To cut this a little short, York Road, which is a primary site to Site E, is basically a bituminous surface treatment, which is basically a built-up road over the years by oiling over, chip sealing, and oiling. The main route to alternative sites as discussed in the EIS is over federally-funded T-62

roads and they are built for the levels of service that the report T-62
states that will happen and are needed to haul the trash to Site E.
Intersection levels of service, called LOS in the report, are
presumably for peak-hour rates. Haul traffic supposedly will be
scheduled to operate during off-peak periods, which are generally
in the level of service A through C levels. Traffic analysis in
this EIS does not take into consideration the added congestion of T-63
trucks on narrow two-lane roads with no passing lanes, such as York
Road to Site E vs. trucks on the four-lane highways which provides
a passing lane for vehicles who pass slow-moving trucks as are
existing hauling to Site A or City-County landfill. Traffic
analysis adds trucks to average daily trips as a single vehicle.
Trucks are equivalent to up to six or more design vehicles. T-64
depending on grades and roadway design. The EIS does not discuss
any of these facts. All the above data and analysis is predicated
on the basic assumptions in the EIS, one of which is that only
trucks from the transfer station will operate and haul to any site
we do pick. What about trucks from the rest of the County as their
landfills close up? What about trucks from neighboring counties as
their landfills close up? In order to evaluate the cumulative T-65
impacts, these facts have to be considered. In other words, the
trucks and the daily trips that are listed in this EIS don't come
anywhere close to the impacts, the true impacts, that opening a
landfill would have. Where are the costs, and the budgets, and the
data that we need to make an educated evaluation of any of the
options? In light of the recently-signed contract with Great
Falls, it appears that the no-action alternative is the best and T-66
the cheapest alternative that we have. An educated evaluation

rests on concrete economic data. We need more time, not only to read this document, but to digest and analyze the concrete data that we don't have yet. I would ask for more time and, as Mona said, we need supplements to this EIS. Thank you.

T-66

Mr. Staley: Thank you. Jake Dodge.

STATEMENT OF JAKE DODGE

My name is Jake Dodge. My address is 5700 York Road. I am a sixth grader at Radley School in East Helena, and I am concerned about the decision being made about the solid waste disposal in Lewis and Clark County. I would like to thank Mr. Robinson for sending me a copy of the Draft EIS even though much of it was above my level of understanding. One thing I did understand is that this landfill is going to cost a lot of money. After looking at Table 5.1-1, it shows that the capital costs of Site E and A are about the same. However, when compared to the CCSS landfill these other two sites would cost 57 times more than the privately-owned landfill. Also in comparing the estimated cost per ton, it appears that there is no significant difference between any of the sites. The capital costs, however, are tremendous.

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My only other comment would be a plea for common-sense decisionmaking. My dad went through many of the items in this EIS with me, and we compared many of the resources in the Summary of Impacts. In all honesty, not one of these sites stood out as a clear-cut winner. They all seemed about equal. There was one big difference, however, concerning the overall site. The CCSS landfill is already a landfill--site E and A are not. I don't understand why we need a new landfill. If responsible parties from both counties would realize the common need, if government

T-68

officials would realize that landfill operations are operated best by professionals in the field, if the people of Lewis and Clark County were made aware of the true costs of developing, operating and maintaining a new landfill, and if County officials were sensitive to the costs they are asking residents to pay, there is only one common-sense choice. Let's not create another area of impact. Let's not let future generations pay for bad decisions today. (Applause)

T-68

Mr. Staley: Thank you, Mr. Dodge. Helen Ammundson?

STATEMENT OF HELEN AMMUNDSON

My name is Helen Ammundson. I reside at 811 11th Avenue. My comments are very brief. There are a few glaring statements that I found in the EIS. One: The Department does not find any one alternative disposal site to be significantly superior to any other alternative site or the proposed action. Looking at the data, I think there should be an analysis and a recommendation. No. 2 really disturbed me after I attended many scoping meetings, I attended every meeting there was here, and we were reassured that issues and concerns would be addressed. However, it states in the EIS proposed document that it was not possible to address every issue and concern raised during siting studies or the EIS scoping process. That concerns me a lot. The other thing that Jake just brought up also was to look at the costs. The capital cost start-up, Site E and A, we are looking at up to $9.7 million dollars vs. CCSS $170,500. It seems as though there should be some recommendation about impacts and which site is the preferred site. That's all I have--thank you.

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Mr. Staley: Thank you. Kent Dodge?

STATEMENT OF KENT DODGE

My name is Kent Dodge, and I live at 5700 York Road. I have been a resident of Lewis and Clark County and in the Water Resources work for about 15 years. What I would like to speak about tonight is the groundwater resource at Site E and concentrate mostly on the direction of flow and water quality. If you look at Figure 3.2-2, the potentiometric map included in this report are for water levels measured in September 1990. Not only was this a drought year but the measurements were collected in the fall when the water levels were at their lowest. The potentiometric map, for purposes of a landfill, should look at a worst-case scenario because of the potential impacts. Springtime water level measurements should be the primary illustration included in this report. T-72 I wanted to check the water level calculations and found that no data were included in this report. There is no information indicating if land surfaces, which are used for calculating water level elevations, were determined by level or simply picked off a topographic map. The contour intervals for the USGS-Lake Helena topographic map are twenty feet. If elevations were picked off a topographic map, other interpretations of this data might be possible. Since this report included no data to substantiate the figures interpretation, I was only able to review the text written T-73 about the groundwater flow. The text says that the groundwater flows to the east, the south, the west, from the northwest corner of the site. These three directions of flow are a great concern. The west flow goes directly into the Helena Valley which is considered a sole source of domestic supply for about 13,000 residents. The EIS states, and this is referring to the Helena T-74 aquifer, "Because of this communication among and between the different layers of materials, the Helena Valley groundwater is believed to act as one complex aquifer." I don't know that much about environmental law, but I do believe that when proposed developments have a potential to affect the sole source aquifer, special regulations concerning the development go into effect, and none of this was mentioned in the EIS. T-74 The south groundwater flow goes in the direction of the Helena regulating reservoir which is only 4,100 feet south of the proposed landfill. Contamination in this direction could affect the entire Helena Valley aqueduct system. T-75 The east groundwater flow would affect the headwaters of Cedar Creek, a small spring-fed tributary whose mouth at Hauser Lake is less than two miles away from the landfill itself. The source of these springs has never been verified. T-76

In regards to water quality, groundwater quality, on page 2-29, and I'm quoting here: "A groundwater monitoring plan was developed in response to DHES's notice of deficiencies in the license application. It provides for a baseline sampling on three on-site monitoring wells and three off-site domestic wells prior to the acceptance of waste at the landfill. Sampling events would be scheduled to generally coincide with the seasonal maximum and minimum groundwater levels anticipated to occur in May and November, respectively." My first point here is that the location of the domestic wells was not discussed in the EIS and what's more important is there's no analysis included in this report. Were water samples collected? If not, then it seems they must be T-77 collected before any waste can be accepted. If samples were collected, were all the constituents listed on page 2-30 part of T-78

the baseline analysis, including the 46 volatile organic compounds?
Baseline analysis should be exactly what is being analyzed during T-78
the monitoring program. This is the only way to quantify
environmental impacts. In conclusion, my understanding of the
purpose of this hearing is to allow concerned individuals the
opportunity to comment on the contents of this EIS. My primary
focus was on the groundwater resource at Site E. In reading this
report, I feel that the groundwater resource has not been seriously
considered because maps showing groundwater flow patterns are based T-79
on a best-case scenario, no data was available for potentiometric
map interpretation verification, no discussion of sole source
aquifer protection was included, no inception of a groundwater
quality monitoring program was verified, and no analysis of water
quality samples were included. Basically, there is nothing in this
EIS that was not already included in the inadequate environmental
assessment. Contamination of the groundwater resource will impact T-80
the human environment. It would be negligent to allow a new
landfill to be developed without a groundwater investigation.
Thank you. (Applause)

Mr. Staley: Thank you. Mr. Staley accepted an Exhibit from
Mr. Dodge. D. Lawrence?

STATEMENT OF M. D. LAWRENCE

My name is M. D. Lawrence. I live on Lakeside Ranch which is
right on Hauser Lake, and most of what I intended to talk about has
already been covered by Mr. Morrison and Ms. Jamison, but I am
concerned about the creek that Mr. Dodge mentioned. That creek, T-81
known as Cedar Creek, runs through our property and about a mile of
it is inside our property lines and directly into Hauser Lake, of

course. Now that stream is fed entirely by springs up at the upper end and the rising point of that is only a short distance down the hill from Site E. There are a lot of springs in there, and as near as I can tell, nothing was covered in the EIS as to what effect groundwater or any leakage from Site E might have on the springs T-81 and on the creek itself, and I think that this is something that should be further investigated. We like our creek that comes over there and we sure would hate to see the thing become contaminated any worse than it is just naturally by animals and so forth. Since somebody already stole my thunder, I'll stop at this point. Thank you.

Mr. Staley: Thank you. Cleber Ammundsen.

STATEMENT OF CLEBER AMMUNDSEN

Yes, my name is Cleber Ammundsen. I reside at 811 - 8th Avenue here in Helena. I have, the EIS is not complete, at least in two ways that I have found. One is this Cedar Creek. Nowhere T-82 on any of your maps in this document is there any mark indicating any stream in the area of Cedar Creek. There is an indication in the EIS that the springs are affected by irrigation and that may be the source of the stream in certain periods of the year. There was a comment in the EIS that as of field surveys conducted in December 1992 and as recently as April, which is the date of this document, so I don't know if that data was analyzed or much study really was done, that there was a heavy discharge from one or more of the T-83 springs feeding the stream. The EIS does not show any attempt to analyze the impacts of leachate contamination or what would be needed to prevent it on the springs. There is several comments in there about the effect that the contamination might have on existing wells. There is nothing said in there of the effect of the springs. If the springs become contaminated, and Cedar Creek is contaminated, that flows directly into the Missouri River, T-84 Hauser Lake. The documentation attempts to wrap up the discussion of the springs with a quote "Assuming mitigation measures are taken, the quality of these sources should not be adversely impacted." It does not describe what these mitigation measures are, nor exactly what needs to be done to prevent the contamination T-85 of this stream, nor does it itemize the associated monetary costs of such mitigation because it doesn't go into the mitigation. I would like to add that while the stream may be affected by irrigation activities, it is not dependent upon them, as is mentioned in the document. I have here several pictures showing water flowing from the springs that were taken in December and T-86 January, December of 1992 and January of this year. I also got a picture of a deer that resides in that spring creek bottom. I will include these pictures with my testimony when I submit the written testimony.

Now I have another--the EIS is also incomplete in the area of costs. The summarized amounts in Chapter 4 are neither complete nor do they appear to have any basis. I am a certified information systems auditor. In other words, I am a certified computer auditor. This basically means that I am certified to audit from the outputted computerized summaries back through the computer to T-87 the source documents. None of the summaries in the document are itemized. So there are no breakdowns to the detailed costs rounded to the nearest dollars. This condition renders the report basically, in this case, unauditable. Some of the estimates are basically meaningless. For example, the quote "Preliminary estimates for a gas collection system for a landfill similar in size to Lewis and Clark County's range from $200,000 to $2 million dollars." This results in a difference of $1.8 million dollars which is really no estimate at all. More, it is just a guess. T-88

The annual landfill operation and maintenance has a summarized total of $.7 million dollars to $1.2 million dollars. There is a long shopping list of items composing the O&M, but there are no individual costs associated with each of these items. If we had the detailed costs of the summaries rounded to the nearest dollar, we could determine the basis and the validity of the cost estimates. Thank you. (Applause) T-89

Mr. Staley: Thank you. Wayne Miller?

STATEMENT OF WAYNE MILLER

I'm Wayne Miller, Box 4087 in Helena. I am going to quote something in a letter I wrote to the Department of Health and Environmental Sciences Solid and Hazardous Waste Division in October of 1991 with copies to the City and County Commissioners because I don't see any evidence that any of this was ever considered in any of this draft statement.

Since 1985 I have been the owner of 540 acres of land north of Site E and my son-in-law has been farming Site E and my land. Sometime in 1986 I was approached by Bob Rasmussen about another piece of land I own, of which Site A is a part and asked if I would consider selling it as a possible landfill site. At the time I declined. Soon after that I commissioned a study of the development potential of the land of which Site A is a part and also my land adjacent to Site E. The study concluded that Site A T-90 would probably not reach development potential within 50 years; however, it was projected that the land adjacent to Site E would reach development potential within 10 to 15 years. At the time, five sites were under consideration for the landfill. My consultant stated that although the chances of Site E being selected were low, that it would be in my interests to offer Site A as an alternative. I, therefore, advised Mr. Rasmussen that I would offer Site A as a landfill site. During the week before the final selection process, I met with Mr. Rasmussen to discuss the landfill selection process. I asked him whether my price for Site A was competitive and expanded the take of Site A so that it would all be within Lewis and Clark County. He stated that my price was all right and that it was his opinion that Site A would be selected for the landfill. A day or two before the selection was to be made, I was advised by a Commissioner that the selection of Site E had already been made and the meeting was merely window dressing. I was skeptical but presented my reasons at the meeting as to the problems with Site E. Among these problems are the following, and you've heard a lot of these. I'll just list them very quickly here. Site E is much farther away from Helena than Site A. You would have to use the York County Road instead of Highway 12 which the government has to maintain, the Federal government. There was no acknowledgment of increased fuel costs over 50 years. Trucks will have to detour around Lakeside during the winter because of the steep slope of the west end of Diehl Lane. There was no analysis of subsurface water on the landfill site except at the edges, because Bryan Diehl would not allow it, and I happen to know that because I had the contract with Mr. Diehl to farm his land,

T-90

T-91

T-92

and I know that he forbade anybody to come on the land, so that when they said that there was tests done, it didn't happen. When I questioned that at the meeting, I was told that that's true but we did it right at the edges of the ground on a 320 acre parcel of land. If you are testing something on the edges, I don't think you're giving it much of an analysis. T-92 Another problem is Site E is much more visible than Site A. When you drive to Site E, you could drive right into it. Site A, you wouldn't even know it was there if you didn't know that's what it was. It's hidden by hills on almost all sides. T-93 There are many more people that would be impacted by the landfill on Site E than to Site A. Seagulls would be flocking to the Site E landfill placing them very close to the path of airplanes coming into the airport and Site E is much more active in terms of increases in population than Site A because of the quicker development potential of it. T-94 At the site selection meeting I was told that Site E was cheaper than Site A and had a longer life. However, the numbers used to calculate the costs were presented in such a way that fuel and other costs were minimized. When I offered to reduce my asking price of Site A by $50,000, I was ignored, and I don't see any sign in any of this stuff that has come subsequent that I have been agreeable all along to taking less money for this, but they still keep using the same old figures in computing the relative values of Site A to Site E. T-95 Soon after the Site E land had been purchased, drillings were made on Site E. Problems with water necessitated that the landfill site be reduced considerably to the point that it no longer had a longer useful life than Site A. T-96 Also other expenses such as longer trips, fuel cost increases, etc. indicate that Site A would be more economical T-97

even with the larger initial purchase cost. OK, and for about the T-97
27th time I will state again that if it is determined by whatever
body that Site A is a better site, I will accept Site E at the cost
that the County Commissioners paid for it in the condition that it
is now, and I will reduce my price for Site A by $50,000 or more T-98
dollars, so for those that are worried that the County is going to
be left with Site E if they change it, that's not going to happen.
OK, then I've got a few questions. One of them is the thing like
when I told Bob Rasmussen before the meeting that I would take less T-99
and I have stated that several times in other meetings, why has
this constantly been ignored? Also, how could they pick Site E
without drilling? That will always remain a mystery to me. How T-100
are they going to truck to Site E in winter? I have been told by
two separate people that one of the things they want to do is run T-101
a road from the regulating reservoir north through to Site E.
Well, I own the land that is between the regulating reservoir and
Site E and I am damn well not going to sign something over so that T-102
they can run a bunch of trucks through some land that they've
already seriously diminished the development potential for. Why
was railing to Site A not considered? There are so many -- you
know, when you really think this over, it's so obviously logical.
You've got this -- right now, they've got the site over by the YMCA
where they're dumping this stuff now. Just put a little spur over T-103
there and have five or six boxcars, fill the stuff up, and once a
week or whatever take the stuff out to Helena. I think there's
about a 3,600 foot spur that would have to be connected up to Site
A and you would have all the problems with trucking and stuff
eliminated and the blowing garbage and all that. Another question

which surfaced in the last few months..Why did they drill only one well in Site A just recently, for which by the way I have not yet been paid. (Laughter) They drilled a well and instead of three wells which they said they were going to do, but then they say Site A -- we just don't know enough about the water situation at Site A. Well, I talked to the person, somebody, about this on Site A and I was told that the well, I think, was dug down to 84 feet, that it was in -- there's a lava whatever -- I'm not technical on that stuff -- but that it was basically a good site for a landfill in terms of the water. I don't know why they didn't drill three. It's like, well, we've made the thing here saying that we drilled a well, but we didn't drill three because then -- now we can say we don't have adequate information about Site A as far as the water. T-104

They mentioned the thing about the FAA maybe having a problem with the 10,000 foot distance from the airport, but I think that, I would like, and again they never asked anybody at the FAA if that was a problem. It's like well, we've already discounted Site A so why bother to ask this question. I would bet that if you took people out from the FAA and showed them both sites, that if you saw one where the seagulls were flying up and down, maybe up to 1,000 feet in the air, and it was right in the flight path to the airport, and then you took them to this place that is almost completely the opposite perpendicular to the place and it's 10,000 feet away, they would say "God, don't build this in a place where seagulls are going to be flying around the flight path of an airplane." T-105

My other question, and I will not get an answer to this: Were any of the proposals that I suggested such as lower price, I offered to carry the contract at 8% even though all the T-106

T-106 figures were calculated at 10%, the more acreage, was that considered? T-107 Have they considered anything of combining Jefferson and Lewis and Clark Counties since my Site A landfill, there's also enough land in the Jefferson County side to build a landfill there, so you could have a landfill that would serve both counties and there would be a lot - you would hear so much less of this bitching between the two County Commissioner groups as far as who is dumping garbage on who. T-108 Has anything ever been done about the rail to landfill? I know at least one of the County Commissioners who feels that that is an excellent option, and I have never seen it listed anywhere. T-109 Has anybody ever mentioned the thing about the adjust costs for fuel increases? T-110 And, I don't know, it's like being in the path of a bull elephant in heat and nothing. It's like nothing that you say makes any effect. I feel like I've been here saying the same damn thing about ten times and I never see it, it's never even alluded to, it's like I'm not even here, so. Thanks. (Applause)

Mr. Staley: James Jensen.

STATEMENT OF JAMES JENSEN

Thank you. My name is James D. Jensen. I am Executive Director of the Montana Environmental Information Center. I represent MEIC here tonight. There are precious few things that need to be said after that. (Laughter) And it's not because I've always been that partial to seagulls either, but. T-111 I would like for one brief moment, and a rare one, to say that I would like to agree with something that Blake Wordal said. That's been a rare opportunity lately. And that is that this process must stop, and even though it reminds me of the Allen Spur Dam proposal on the

Yellowstone River that never seems to go away, one of the worst ideas the government has ever come up with, ever, and it won't go away, this is a similarly bad idea and it won't seem to go away. It ought to go away, and I agree with Blake; it's time the T-111 Commissioners should get off of this horse. In somewhat more substantive points, I would like to point out that Subtitle D regulations may, or may not, ever be required of this landfill. The National Association of Counties of which the Montana Association of Counties is a member, of which the Lewis and Clark County Commission is a member, have consistently testified in Congress that landfills serving populations of this size ought to be exempt from the strenuous regulations under Subtitle D. And they may sometime prevail. Senator Baucus in having risen to a level of influence and possibly even power has been traditionally somewhat sympathetic to Montana small community concerns about regulation under the applicable statute which is the Resource Conservation and Recovery Act. So, unless the current Subtitle D regulations that have been circulated are made a specific part of the requirements of this permit, they ought -- any reference to T-112 them ought to be deleted from the EIS and it ought not stand on them. I would ask that -- just to reenforce what Ms. Jamison said, that it seems appropriate for a limited extension of time for written comments to be submitted by the public. MEIC would like that opportunity for at least 14 days beyond the hearing tonight T-113 and that it clear that the Administrative Rules and the Statute MEPA require a supplemental environmental impact statement be T-114 prepared and, finally, I guess if we have learned anything tonight, we probably should have bumper stickers on our cars tomorrow saying T-115

"Jake, for County Commissioner." Thank you. (Laughter and applause) T-115

Mr. Staley: Thank you. We're just about out of tape on our recorder, so why don't take a 5-minute pause so we can flip the tape? We'll start taking the last few items of testimony at that time.

After the break from 8:40 to 8:50, Mr. Staley called Bill Verwolf for his statement.

STATEMENT OF BILL VERWOLF

T-116 For the record, my name is Bill Verwolf. I am City Manager of the City of Helena and I am representing the City Commission at this hearing this evening basically to go on record of approval of the EIS that was prepared and the issuance of a permit for the operation of the landfill at Site E. T-117 To go into a little history, the City of Helena, Lewis and Clark County, as Mr. Wordal indicated, started this process some ten years ago. One of the things we decided when we started the process is that we wanted to do as openly public and as responsible a job with this process as we could. We started with selection of a professional consultant to do the analysis of potential sites that were available. We went through that process, narrowed those down to some five sites, we held public hearings, and made some determinations that ended up as a matter of public policy by both the City Commission and the County Commission with the selection of Site E. We had full public hearings in terms of neighborhood impacts on both Site A and Site E, and I must comment that they were very similar. Different people, but some of the same concerns expressed on both sides. I think the process that has been gone through has been very complete. I think the EA had a lot of background material that was not included in the document itself but that was available that has now been included in the EIS. In addition to the additional T-117

information that was generated at the request of the consultants hired by the state to put this EIS together, I think we are at a position now where, in terms of a landfill operation for Lewis and Clark County and the City of Helena, which obviously is something that has to happen. Either it has to happen in this valley or we are going to have to haul the garbage out of the valley because the City of Helena is essentially out of room. By September 1st our current landfill operation will be closed and we, of course, have entered into a contract to haul the garbage to Great Falls until T-118

this particular decision is made. If the calculations of cost are correct, it's going to cost us more money to ship the garbage to Great Falls than it's going to cost to put it in a landfill at Site E, so we are interested in reducing that amount as soon as possible. I would say that if, in fact, the final calculations on Site E indicate that it costs more than it would cost to go to Great Falls I think the City and County Commissions will definitely consider whether they would immediately open Site E or not for T-119

economic reasons. I don't anticipate that that's going to be the case. Our costs to haul to Great Falls is approximately $27.00 a ton. That includes the landfill tipping fee in Great Falls and the transportation costs. So, with that history, what we basically tried to do is come to as reasonable a location as environmentally sound a site as we could find in the valley, and through the hearing process and the input from as much public as we could have come to the meetings. City and County Commissions have both made T-120

T-120

decisions, and I think it's time to reach conclusion and determine where we are going from here. And I thank you very much.

Mr. Staley: Thank you. Joe Campeau.

STATEMENT BY JOE CAMPEAU

My name is Napoleon Joseph Henry Louis Campeau. (Laughter) Call me Joe. We're meeting here to hear our concerns, and I'd like to share a couple of those.

T-121

We in the vicinity of TOK Park, who draw fresh water from our wells, and smell fresh morning air and see our new mine when we go to work, have really good water and good air and kind of an impacted view right now, but we also share an affinity and a concern for our lakes and our rivers. We are all very concerned about introducing mega tons of waste and how many mega gallons of contaminated water within the limits of an area that feeds our wells.

T-122

As I perused the EIS and the EPA design criteria, my concerns are magnified because there are so many pages given to damage control. In computer jargon, this is "what if?" What if there's a failure? We can do this, we can do that, we can drill some more, we can do this, we can suck it off, we can transport it, we can treat it, we can do all of these things, but that's after it enters the aquifer. All of this solid and liquid waste is held back in a dam made of 24 inches of compacted earth. And I hope, if it's in conformance with the EPA design criteria, a 60 ml PVC or other single-ply membrane would be added to that. Sixty mills is 60/1000 of an inch.

T-123

The same stuff as architects specify for roofs. Frank Lloyd Wright was dining in one of his clients' new buildings when a storm came and the roof started to leak and it dripped right in one of the guests' soup. He commented, "The soup was too thick anyway." (Laughter) I wish I

T-123

could say the professional roofers that install similar materials on my buildings never had a failure. I can say it's the exception when we don't have one that fails in some degree.

T-124

My soup is just right. I want some more assurance that it'll stay that way. I want it to stay at a known cost. Monitoring is addressed in the EIS, but the cost of treating leachate in the event of a failure is not. And the cost to mitigate the potential failure in varying degrees are not addressed to my satisfaction. Based on a history of landfills, I want more actuarial statistics of failures and the cost to taxpayers for the varying degrees of repair. When I buy a car I go get the "Consumer Report" and I see that that car costs so much to replace a bumper, so much to replace a transmission. What if you have a failure of this device? I want to know what it's going to cost for the varying parts of pieces that are going to fail. There has to be some statistical information predicated on experience over a number of these that have occurred and been constructed.

T-125

My soup is just fine; help me keep it that way. But show me that I will not pay gourmet prices to keep it that way. I run across Cedar Creek almost every day when these old bones will get up early enough, 5:30, 6:00. It's dark a lot of those times, and I enjoy running across Cedar Creek, and I prefer it just like it is, and I don't want to see it glow in the dark.

Mr. Staley: Thank you. Frank Crowley?

STATEMENT OF FRANK CROWLEY

Mr. Chairman, my name is Frank Crowley. I am a resident of Helena. I live at 807 - 2nd St. I am counsel for Mr. Ben Sale who last year purchased the City-County Sanitation Services landfill which is located 7 miles from Helena, 1 mile southeast of the

ASARCO lead smelter. Mr. Sale bought this landfill with the intention of providing a cost-effective regional landfill option for this area, and he has been involved in extensive discussions over the past year with the City of Helena and over the past few months with Jefferson County and Broadwater County.

T-126 If I were to summarize Mr. Sale's position on this issue I would say it has two facets. One, is that there should be only one small regional landfill serving this area, and secondly, since every facility now has to meet Subtitle D requirements, that whoever can do it the cheapest should serve the area.

T-127 In fact, when I shared with Mr. Sale on the phone the other day that the City of Helena had signed a contract with Great Falls for a year in the vicinity of about \$25 to \$26. Mr. Sale said "If they can do it for \$25 or \$26 then the City of Helena should go to Great Falls." Because he said that's probably going to be the cheapest option that they have, even if it's not me, that's what the people in the city deserve.

T-128 I am here tonight simply to state that we are aware of the zoning issue that has come up in Jefferson County and I'm not here to debate that issue. I know you have addressed it as best you can in the EIS. I would like to state that at the time the Jefferson County Commission renewed that zoning ordinance last February there was discussion among the commissioners that they wanted to make sure that should they go ahead and renew this zoning ordinance, which as you know is our position is not a valid ordinance to begin with, that they want to make sure that if they did renew it, it could be rescinded at any time. And, they were assured at that time that it could be rescinded at any time and, with that assurance, they proceeded to renew this zoning restriction. And I will provide you with materials along that line. Suffice it to say that Jefferson County has been considering Mr. Sale's facility, and Mr. Sale also met with Broadwater County and they were also very interested in his facility. Mr. Sale expresses his regret that, with an existing 60 acre license site 7 miles from Helena there appears to be an acceptance at some level in the local governments here that this is a logical site for the service to be provided. Because of the extensive discussions and negotiations he has had, there is a recognition at some level -- it just makes sense -- that you don't have to be a rocket scientist to figure this out and so on. He also recognizes that he is coming in somewhat late, or rather late in the process, that the commissioners have been at this a number of years, but so has the regulatory environment changed. Things were not what they are now 10 years ago, and the local governments here have to confront the existing regulatory climate and what makes sense today. I know they have put a lot of hard work in on this issue and so does Mr. Sale. He would be greatly appreciative if local governments in this area found a way to come together at a table, to sit down and rationally discuss what makes sense here for this region. To his knowledge, there has been no initiative taken by any local government, whether the City of Helena or Lewis and Clark County or Jefferson County, to come together and figure out a way we can use this existing 60-acre site, rather than build an entire new facility in a sensitive area. He doesn't know how to get that going. I think he has tried to make initiatives in that direction. As far as he is concerned, there is just a very frustrating lack of communication and cooperation going on at the local government level here. In his opinion, the local governments

T-129

T-130

are here to serve the ratepayers, to serve the taxpayers, and they have an obligation to select for the long term, for the next 30 to 40 to 50 years, they have an obligation to the people in northern Jefferson County, in Helena and Lewis and Clark County, Broadwater County, to select the option that is in the long term going to be the most cost effective. As far as he knows, aside from Great Falls, aside from what has happened now with Great Falls, he is able to provide that lowest cost option. If the numbers come out differently when they come out and somebody is able to offer this service, long term, at a lower price than he is, as I have stated, that is the individual or entity or the government which should provide the service. But he is pleading through me tonight for the ratepayers and also for the long-term provision of cost effective solid waste services that this document reflect the needs of people who are going to eventually pay for his service. He stands willing to provide that service if, in fact, he can provide it at the least cost. Thank you very much.

T-130

Mr. Staley: Thank you.

Mr. Thomas Morrison stood with a comment on the sign-up sheet placed at the back of the Conference Room. He said the form required anybody to say if they are for or against. He said: I think that's a bit confusing. I would like to state for the record that for most of us we are interested in a valid EIS process--that's what we're for. What we're against is having an invalid EIS process, incomplete EIS process, but I'm not sure what we're saying we're for or against when we indicated such on our form. I just wanted to state that for the record.

T-131

Mr. Staley: All right. Could you also, for the record, state your name?

Thank you, Thomas Morrison.

Mr. Staley: OK, Mr. Morrison. I just want to respond to that. These forms are used for a whole bunch of different types of hearings and that I did not use them that check off, favor, oppose, or neutral to order the calling of the testimony or anything like that.

Morrison: I just wanted the record to state that when I signed that form I didn't. and I'm sure many others in the room know for sure what they are for or against, and that we wouldn't want any negative implications drawn from that.

T-132

Mr. Staley: Sure. There were a number of requests for an extension of the comment period tonight. The Department will take that under advisement and if we do choose to extend it we'll get notice out as soon as we can. With that, I'll conclude the hearing. I want to thank you all for coming tonight and remind you that you may submit written comments until May 24th, 1993. Thank you, and that concludes the hearing.

The hearing was concluded at 9:05 p.m.

STATEMENT ON BEHALF OF LEWIS AND CLARK COUNTY
PUBLIC HEARING ON DRAFT EIS FOR LEWIS AND CLARK COUNTY LANDFILL
May, 17, 1993

Good evening. I am Blake Wordal, Lewis and Clark County Commissioner. Tonight, I am representing Lewis and Clark County and commenting on our proposed landfill known as Site E.

We have reviewed the Draft EIS and, not surprisingly, support the finding that the site should be licensed by the state. The Draft EIS states what we have maintained since submitting our application -- that Site E is an environmentally good site for a landfill.

The county fully intends to construct a landfill which meets all of the requirements of Subtitle D even though those requirements are not yet in force and there is considerable question when those requirements will actually go into effect.

We agree with the recommendations contained in the Draft EIS regarding the importance of recycling and composting solid waste. Both the county and the City of Helena have instituted recycling programs, and we plan to continue and to strengthen those programs with the operation of both the landfill and the transfer station. In addition, we are working with the City to develop a composting operation as a part of our overall solid waste program.

Finally, I want to comment on the process. The very first meeting I attended as an elected official concerned the planning for a joint city/county landfill in 1983. Ten years ago, we believed that it was in the best interests of both the county and the city to join together and plan for the future of solid waste disposal in our area.

During that time, we investigated many sites for a future landfill. We evaluated each of them and made a public policy decision to license Site E because of its environmental and economic advantages. Every step of this process involved broad citizen participation. The Draft EIS validates all of the work and the decisions which were made several years ago. Technologies have changed and requirements for landfills have become necessarily stricter.

Also during those ten years, costs have soared to comply with those technologies and requirements. With each passing year, the cost of disposing solid waste escalates for the citizens of Lewis and Clark County and the City of Helena. As you know, the City will close its landfill and transport waste to Great Falls this summer because Site E is yet to be licensed. Transporting waste to Great Falls will cost the city's ratepayers an additional $30,000 per month over what disposal at Site E would involve. The debate over where the landfill should or should not be located has raged for at least ten years. There must be an end to this process. The costs are simply too high for this debate to continue.

[redacted]

Ex 1

We encourage you to accept the determination of the Draft EIS and license Site E without any further delay. We reserve the right to respond to the comments you receive tonight.

Thank you.

May 17, 1993

Robert J. Robinson
Dept. of Health and Environmental Sciences
Cogswell Building
1400 Broadway
Helena, MT 59620-0901

[redacted]

EX 2

Dear Mr. Robinson:

These are some notes compiled on the groundwater resource at the Site E landfill that I would like to comment on.

DIRECTION OF FLOW

See Fig. 3.2-2

The potentiometric map included in this report are for water-levels measured in Sept. 1990. Not only was this a drought year, but the measurements were collected in the fall when water-levels were at their lowest. A potentiometric map for purposes of a landfill should look at the worst case senerio because of the potential impacts. Springtime water level measurements should be the primary illustration included in this report.

I wanted to check the water level calculations and found that no data were included in this report. There was no information indicating if land surfaces, used for calculating the water level elevation were determined by level or simply picked off a topographic map. The contour interval for the USGS Lake Helena topographic map is 20 feet. If elevations were picked off a topographic map, other interpretations of the data might be possible.

Since this report included no data to substantiate the figures interpretation, I was only able to review the text written about the groundwater flow. The text says that groundwater flows to the east, south, and west from the NW corner of the site. These three directions of flow are of great concern.

The west flow goes directly into the Helena Valley which is considered a sole source of domestic supply for about 13,000 residents. The EIS states "Because of this communication among and between the different layers of materials, the Helena Valley groundwater is believed to act as one complex aquifer". I don't know that much about environmental law, but I do believe that when proposed developments have a potential to affect a sole source aquifer, special regulations concerning the development go into affect. None of this was mentioned in the EIS.

The south groundwater flow goes in the direction of the Helena Regulating Resevoir, which is only 4100 feet south of the proposed landfill. Contamination in this direction could affect the entire Helena Valley Aquiduct System.

The east groundwater flow would affect the headwaters of Cedar Cr., a spring feed tributary whose mouth at Hauser Lake is less than 2 miles away from the landfill itself. The source of these springs has never been verified.

GROUNWATER QUALITY

see page 2-29.

"A groundwater monitoring plan was developed in response to DHES's Notice of Deficiencies in the license application. It provides for baseline sampling of 3 on-site monitoring wells and 3 off-site domestic wells, prior to the acceptance of waste material at the landfill. Sampling events would be scheduled to generally coincide with seasonal maximum and minimum groundwater levels, anticipated to occur in May and November respectively."

1. The location of these domestic wells is not discussed.
2. No analysis are included in this report. Were water samples collected? If not, then it seems they must be collected before any waste can be accepted. If samples were collected, were all the constituents listed on page 2-30 part of the baseline analysis, including the 46 volitile organic compounds? Baseline analysis should be exactly what is being analyzed for during the monitoring program. This is the only way to quantify environmental impacts.

My understanding of the purpose of this hearing is to allow concerned individuals the opportunity to comment on the contents of this EIS. My primary focus was on the ground water resource at Site E. In reading this report I feel the ground water resource has not been seriously considered because maps showing ground water flow patterns are based on a best-case senerio, no data was available for potentiometric map interpretation verification, no discussion of sole source aquifer protection was included, no inception of a ground water quality monitoring program was verified, and no analysis of water quality samples were included. Basically there was nothing in this EIS that was not already included in the inadequate Environmental Assessment. Contamination of the ground water resource will impact the human environment. It would be negligent to allow a new landfill be developed without a ground water investigation.

Sincerely,

Kent Dodge
5700 [illegible]
Helena, [illegible]

May 17, 1993

Mr. Robert J. Robinson
Dept. of Health and Environmental Sciences
Cogswell Building
1400 Broadway
Helena, MT 59620-0901

[redacted]

EX 3

Dear Mr. Robinson:

My name is Jake Dodge, I am a 6th grader at Radley School in East Helena, and I am concerned about the decision being made about solid waste disposal in Lewis and Clark County. I would like to thank Mr. Robinson for sending me a copy of the draft Environmental Impact Statement, even though much of it was above my level of understanding.

One thing I did understand was that this landfill is going to cost alot of money. After looking at table 5.1-1 it shows that the capital costs of Site E and A are about the same, however, when compared to the CCSS landfill these other two sites would cost 57 times more than the privately owned landfill. Also when comparing the estimated cost per ton, it appears that there is no significant difference between any of the sites. The capital costs, however, are tremendous.

My only other comment would be a plea for common sense decision making. My dad went through many other items of this EIS with me and we compared many of the RESOURCES and the SUMMARY OF IMPACTS and in all honesty, not one of these sites stood out as a clear cut winner. They all seemed about equal. There was one big difference however, concerning the overall site. The CCSS landfill is already a landfill and site E and A are not. I don't understand why we need a new landfill.

If responsible parties from both counties would realize the common need, if government officials would realize that landfill operations are operated best by professionals in the field, if the people of Lewis and Clark County were made aware of the true costs of developing, operating, and maintaining a new landfill, and if county officials were sensitive to the costs they are asking residents to pay, there is only one common sense choice. Let's not create another area of impact. Let's not let future generations pay for bad decisions today.

Sincerely,

Jake A. Dodge
5700 York Road
Helena, MT

5-17-93

Lewis & Clark Landfill E.I.S.

Dear Persons.

I attended the meeting held 5.17.93 pertaini to the proposed Landfill. My personal concerns were the way the economic study was compiled. No study has any validity if like comparisons are not studied and economically evaluated on this basis. I would like to recommend that this study be done comparing like expenditures with the most reasonable costs associated with each alternative placed with the appropriate alternative. Then and and only then can economical comparisons be evaluat

Thank you
Donald E Kosena
DONALD E KOSENA
4595 VALLEY DR.
HELENA, MT 59601
227-6456

EX 4

RECEIVED

MAY 1 8 1993

MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID AND HAZARDOUS WASTE BUREAU

[illegible]50 PHOENIX
Helena, Montana
59601

To hom it may conser.

I think you Commisioners Had enugh time to Com up with a spat for the land fill. If we have to Send our garbige to Great Falls and it cost us fifty thousand dollars.

I think every one of you shuld be fired.

U-1

Gilbert J. Longmire

6.5.2 DHES Responses to Public Comments on Draft EIS

The rules implementing the Montana Environmental Policy Act (MEPA) requires the DHES to consider substantive comments or comments that pertain specifically to issues, as opposed to persons indicating whether or not they like a proposed development [ARM 16.2.634(4)]. Simply voicing personal opinions for or against an EIS does not substantively add to the base of knowledge.

Testimony from the public hearing and letters were reviewed several times by DHES personnel and the consultant to identify substantive comments. Some comments are similar, but stated differently from author to author.

There are also "points of contention". These are based more on how people feel or think rather than on facts.

The following substantive comment was often posed and is followed by DHES' answer.

6.5.2.1 General Comment

Why doesn't the MEPA process solve all the problems raised by persons and groups? Also, why can't MEPA be used to require the County to consider a variety of sites or actions for its proposed solid waste disposal?

Response:

It is difficult to talk about MEPA without ultimately talking about Montana's Constitution. Although MEPA was created in 1971 and the new constitution ratified in 1972, they share the common themes of maintaining and improving the state's environment.

Article IX of the Constitution addresses the environment and natural resources. The idea that the state shall maintain and improve a clean and healthful environment for present and future generations is well remembered and often quoted. However, the actual wording of that section implies much more. Section 1 of Article IX states:

> **Section 1. Protection and improvement.** (1) The state and each person shall maintain and improve a clean and healthful environment in Montana for present and future generations.

Letter and Comment No. **Response**

> (2) The legislature shall provide for the administration and enforcement of this duty.
>
> (3) The legislature shall provide adequate remedies for the protection of the environmental life support system from degradation and provide adequate remedies to prevent unreasonable depletion and degradation of natural resources.

Montana's Constitution makes it incumbent on the people, state government and the legislature to work in partnership to meet its aims. The role of the legislature is particularly important since it is charged with creating the laws administered by the DHES and other state agencies.

Although patterned after the National Environmental Policy Act (NEPA), MEPA is a law unto itself designed to meet the needs of Montana. The Environmental Quality Council (EQC) was created by the Act and given the responsibility of coordinating and monitoring state policies and activities that affect the quality of the human environment. According to the EQC, MEPA has two main objectives:

1. Consider the environmental and human aspects of a state agency's proposed action, and
2. Ensure the public is informed and participates in the decision-making process.

To accomplish the objectives, an agency needs to: (1) Ensure other agencies and the public are aware a development has been proposed, (2) to the fullest extent possible, create a broad-based body of knowledge about the existing environment and possible impacts, and (3) promote public participation. All the elements are collectively aimed at giving those responsible for making decisions the best information possible before they act.

According to the EQC, the process fosters better decisions and wiser actions by ensuring relevant environmental information is available before decisions are made and actions taken.

Although it is important to know what MEPA can do, it is equally important to know what it can't do.

Letter and Comment No. **Response**

1. MEPA does not guarantee problems associated with proposed developments will be solved to the satisfaction of all those involved. It is a tool, not a solution.

2. MEPA is not a Siting Act.

3. MEPA is not a research project.

The EIS process does not guarantee potential problems will be solved to the satisfaction of all parties. Since people, not information, solve problems, it is possible to completely go through the process and not solve a single problem. However, the environmental review does provide an opportunity to begin solving problems. The EIS process is a procedural method designed to foster informed decision-making and public participation.

The 1989 MEPA agency rules include the consideration of mitigating possible impacts. The current MEPA administrative rules ask agencies to provide ". . . a discussion of mitigation, stipulations, or other controls committed to and enforceable by the agency or other government agency; . . . ." [ARM 16.2.632(6)].

Some state laws and regulations specifically mention mitigation and provide agencies the authority to take definite steps to lessen impacts. If mitigating measures are outside the legal purview of the agency preparing the MEPA review, mitigation can be discussed, but the ability to require enforceable measures is vested within the express legal authority of the appropriate agency. There are also instances in which mitigation is possible but does not fall within the scope of any government laws or regulations. In these situations applicants have the discretion to decide whether or not to employ mitigating measures.

MEPA is not a Siting Act. The regulations require state agencies to consider "reasonable" alternatives. Depending on one's perspective, what is reasonable varies widely. The rules say agencies are required to consider ". . . only alternatives that are realistic, technologically available, and that represent a course of action that bears a logical relationship to the proposal being evaluated." [ARM 16.2.625 (2)(b)] The rules also state that agencies shall discuss ". . . reasonable alternatives to the proposed action, including the alternative of no action and other reasonable alternatives that may or may not be within the jurisdiction of the agency, if any. . . ." [ARM 16.2.632 (5)]

Letter and Comment No. **Response**

Any discussion of siting ultimately must consider who has the legal authority to approve the placement of a proposed development. The state does have some specific siting authority under the Major Facility Siting Act administered by the DNRC. The state also would have the authority to site a proposed development on state land. The Montana Solid Waste Management Act restricts landfill location in limited situations, but primarily authorizes the DHES to license landfill operation. Therefore this law should not be considered as a Siting Act.

The federal government has the ability to control the placement of proposed developments on its land.

Montana's Legislature has given local government the authority to implement land use planning on private property. The means are available for citizens to institute land use planning, or de facto siting, if the majority chooses to do so. In the absence of local land use planning or local laws, private property owners, including counties, can develop their land any way they choose.

MEPA and its administrative rules do not require agencies to undertake extensive research projects to generate scientific information. Some efforts to gather the most up-to-date data may be more extensive than others, but this generally depends on the issue and the amount of substantive information available on the subject.

6.5.2.3 DHES Responses to Individual Public Comments

Frank Gruber Letter

A-1 Thank you for your comment.

Kent Dodge Letter

B-1 It is agreed that water sampling does not refer to the same procedures as water level measurement. In a response to this comment, Mr. Pat Dunlavy (June 23, 1993) indicated that the newspaper reporter asked him to comment on the frequency of water tests, which could imply quality sampling or quantity (levels) measurements.

Letter and Comment No.	Response
B-2	Mr. Dunlavy (June 23, 1993) responded to the concern that water levels in January and September are likely to be similar, since they are both low water periods, by speculating that the geology at Site E would preclude large seasonal fluctuations in ground water levels (at least, relative to valley-fill aquifers). This may be true, but it is important to determine the difference in water levels between January and September. These months would be expected to represent some of the lowest water levels, and it is important to establish minimum and maximum conditions.
B-3	It is agreed that it is important to establish background water quality conditions for a new landfill so as to have a baseline to compare with future water quality. This information is important to: 1) the landfill operator and owner as a means of determining whether a facility is negatively impacting the ground water resource, 2) the nearby residents and community for assurance of public and environmental health, and 3) the regulatory authority (DHES) to determine compliance with license conditions and to develop corrective action procedures if necessary. Background water quality would have to be determined for Site E or any other new landfill site, including analysis for the presence and concentration of the analytes listed or referred to Section 2.2.4 of the FEIS (page 2-31). Also see response to comment T-77.
B-4	Agreed. See response to comment B-3.
B-5	A plan for quality assurance of sampling and analytical methods would be required prior to landfill operation. Normally, the information discussed in this comment is contained in a Quality Assurance Project Plan and Laboratory Procedures Manual, which in turn are part of a Sampling and Analysis Plan. All field procedures, sample collection and handling methods, and laboratory protocols would be pre-approved prior to landfill start-up.
B-6	Agreed. See response to comment B-3.

Letter and Comment No.	Response
Pat Franks Letter	
C-1	Thank you for your comment.
Wayne Miller Letter	
D-1	Thank you for your input on this matter. Section 4.12 of the Final EIS has a statement to explain your willingness to negotiate the purchase price of the Site A land parcel. However, the original asking price of $400,000.00 was used in the cost comparison in Table 4.12-1 since this was the only firm number available at this time.
D-2	Agreed. Tables 4.13-1 and 5.1-1 have been modified by adding a section incorporating the cost of transporting the waste to each alternative considered. Site A would be the shortest hauling distance of all alternatives and the less expensive for transportation in the long term.
D-3	Agreed. Significant distance of the haul routes to both Site A and CCSS Landfill would both utilize federal highways. Site E would use predominately City and County maintained roads. See Sections 3.9 and 4.9 of the FEIS.
D-4	The incline on Deal Lane has been mentioned throughout the review process with the County. The County has committed to paving and reconstructing both Lake Helena Drive and Deal Lane if Site E is licensed as a landfill. It would be expected that this problem would be dealt with during the reconstruction effort.
D-5	The concerns expressed regarding visual impacts at Site E and Site A were noted in the DEIS and the FEIS (Section 4.11). See Sections S.5.1 and S.5.2, and Table 5-1 of the DEIS and FEIS. It is agreed that the visual impacts resulting from a landfill at Site E would be more than those resulting from a landfill at Site A; however, it would not represent a significant impact.
D-6	Site A is located in a gulch which does in fact transport water during snowmelt and rain events. Otherwise, the statements in this comment regarding the locations of bodies of surface water and water wells are generally correct. However, a

Letter and Comment No.	Response
	number of design and operational requirements should prevent "liquid effluent" (leachate) from reaching surrounding water bodies. First, the landfill would be constructed of a combination of synthetic and low permeability soil liners. Above the liner system will be a leachate collection system to minimize the amount of liquid which is even present on top of the liners. This design, combined with careful, proper landfill operation, should provide an extremely high level of engineering assurance that contaminants will not escape down through the landfill to the underlying water table. In the event that contaminants are released, a ground water monitoring network should detect contamination, and a corrective action program would be instituted prior to off-site migration.
D-7	See response to comment M-8.
D-8	It is assumed that the comment refers to lithologic samples (well cores or cuttings) rather than water samples when referring to hydrogeologic complexity. The data from Site E test wells is not ambiguous, but it does suggest a geology underlying the proposed landfill site which has more variation than Site A is expected to have.
D-9	See responses to comments D-2 and D-3.
D-10	See response to comment D-1.
D-11	Test holes were drilled at Site E prior to purchase of the site by the County. The "downsizing" of Site E referred to in the comment is presumed to be from 189 acres to 80 acres. To our knowledge, the decision to submit an application for license for only Phase I had nothing to do with water quality or quantity. It was believed to be in response to the DHES request for more definition of the ground water system in Phases II and III; i.e., the applicant did not want to spend the resources necessary to develop a complete baseline of the entire facility at that time. However, a letter from the County to Mr. Barry Damschen (Marshall 1990) indicates that the Scratch Gravel Board (the "applicant") decided not to pursue licensing all phases "...because of the several uncertainties apparent at this time, including privatization and litigation".

Letter and Comment No.	Response
D-12	A number of commentors suggested that waste transport by train would be a viable means of moving refuse from the transfer station to the landfill, especially Site A or the CCSS facility. DHES' Consultant on the EIS contacted Montana Rail Link (MRL) to get an initial indication of whether rail would be a viable method of solid waste transport to Site A, or any other site (Coston 1993). MRL suggested that the feasibility of rail transport would depend primarily on three issues. First, was the transfer station designed such that a rail spur could be run to the station, with sufficient room to turn the loaded rail cars around, or room within the transfer station to bring rail cars in for loading? This is a primary concern because it would almost certainly be impractical to load rail cars anywhere other than at the transfer station; this would necessitate an extra loading into, and unloading from, trucks to get to the rail line. The transfer station was not designed to anticipate train access. According to a firm which evaluated the potential of the transfer station for solid waste loading and unloading, the height of the transfer station was insufficient, and there was no room to run a rail spur to the building. Second, the farther away the proposed site is from the rail line. the more capital investment would be involved to build a new spur line. In this regard, Site A is relatively close to an existing railroad line, much closer than Site E. Third, economic practicability is dependent on waste volumes. Rail cars can carry a much greater mass and volume than trucks, but trucks are often more economical than rail cars when there is insufficient volume. MRL was uncertain whether the volumes generated in the Helena area would justify use of rail vs. truck for transport a short distance (i.e., to Site A).
D-13	Thank for your comment.

East Helena Resident's Letter

E-1	Thank you for your comment.

Letter and Comment No.	Response

The Greenfield's Letter

F-1 New information, obtained or considered since the Environmental Assessment on Site E was published, has been used in this EIS concerning environmental resources and the various alternatives. However, concerning Site E ground water investigations specifically, the commentor is correct in that no new wells have been drilled. DHES is confident that sufficient information concerning the subsurface geology exists at Site E for consideration of environmental impacts, and landfill licensing.

F-2 The stream that the commentor refers to is presumed to be that called "Cedar Creek" by other persons commenting on the Draft EIS, although the creek is not named on reference maps used in this study. This creek, although described as ephemeral and not flowing all year round, appears to be spring-fed, as reported in studies done for the Site E license application (Chen-Northern 1990c) and field documented by DHES' consultant in the spring of 1993. The Phase II report on ground water at Site E (Chen-Northern 1990c) concluded that the springs feeding the creek are likely recharged by shallow percolation of local rainfall and/or irrigation ditch flow, and not connected to Site E ground water. The conclusion that the springs in this area are likely not related to ground water below Site E was based on specific conductivities of ground water beneath the landfill being ". . . two to four times higher than specific conductivities of springs east of the site." In addition, it was noted that some springs dry up in the fall after the irrigation canal running through the section is turned off for the season. However, this data is by itself far from conclusive for all springs. We note that the elevations of many of the springs are at or below the water levels (potentiometric surface) measured by the County's consultant in 1990 (see Figure 3.2-2). According to the same data, the springs in and near Cedar Creek are also potentially downgradient from Site E. The variance in specific conductivities between the ground water sampled at wells at Site E and the springs may be the result of irrigation water and/or rainwater mixing with ground water welling from the springs.

In other words, it is possible that water exiting the springs is related to the ground water beneath Site E, and that contamination of ground water resources at Site E, if allowed to migrate, could eventually impact spring water as well. However, see

Letter and Comment No.	Response
	the response to comment D-6. A combination of design, operational, and monitoring requirements should effectively preclude contamination of ground water, and certainly off-site migration of contaminated ground water.
F-3	It is assumed the commentor is referring to zones of sand and gravel in the subsurface below Site E. These areas have not been ignored, but the permeability tests were conducted in water-bearing zones, some of which are in fact sand and gravel lenses or layers. There were no permeability tests done at the levels shown in the comment.
F-4	This is correct, there are only two wells (E-2 and E-4) sited within the anticipated 80-acre boundary of the proposed landfill. Many of the other wells (such as E-7, E-8, and E-9) were purposefully placed on the perimeter of the proposed disposal areas so that they may be used for monitoring wells during landfill operation and after closure. There are nine wells located in an approximate 120-acre parcel. DHES believes the information from these wells has sufficiently characterized the subsurface and defined ground water characteristics.
F-5	DHES believes your concern is not warranted. As noted in the comment, the area northwest of the landfill is thought to be an area of ground water recharge. This means that ground water should flow away from the residence discussed. As shown on the potentiometric surface map in Figure 3.2-2, ground water from the landfill would not flow toward the northwest.
F-6	See response to Comment M-8
F-7	As the nearest residence to the proposed landfill at Site E, the potential for some of the problems you list to have an impact on that residence is certainly a possibility. Many of those impacts have been described in the Draft and Final EISs with possible mitigating measures the County could utilize to lessen these potential impacts.
F-8	DHES disagrees, and believes the Draft EIS meets the requirements set forth in MEPA and DHES' rules implementing MEPA (see Section 6.5.2.1). Please see response to comment M-8.

Letter and Comment No.	Response
Mona Jamison Letter	
G-1	The initial statement within this comment is correct. The original application made in March of 1990 was for a license to operate a 189-acre landfill within the 320-acre parcel of land known as Site E. However, the Scratch Gravel Refuse District Board decided in August of 1990 to reduce the area requested to be licensed to 80 acres or the area originally labelled as Phase I in the original application. This decision was formally made at the Board's August 23rd, 1990 meeting and is recorded in the minutes of that meeting. The Solid Waste Management Program Manager at that time, Anthony Grover, was in attendance and therefore was informed of the decision. The Board's decision was communicated to their consultant, Damschen & Associates, in a letter dated August 27, 1990. Departmental staff were informed of the decision to revise the application in various meetings with the applicant and their consultants. The public was informed of this decision in news reports of the meeting and it was explained during the public informational meeting held by DHES on January 3rd, 1991. Since August of 1990, DHES has consistently viewed the application for a landfill license to be for only 80 acres. The Environmental Assessment released in September of 1991 clearly states that the application is to license an 80-acre landfill. DHES believes the EIS process of review of the revised application for an 80-acre landfill within the 320-acre Site E land area is appropriate and adequate. It is unfortunate if this situation was not clearly expressed in the DEIS and it is hoped that the Final EIS has clearly explained the revisions of this application (see Sections 2.1.3.3 and 2.2)
G-2	As explained in response to comment G-1, the revision to the acreage of the application was made and communicated to DHES and the public in August 1990. During the review of DHES files on this licensing action for the EIS process it was noted that no written notice to the DHES was contained in the files as to this change in the application. To insure that there would be no question about the size of the licensed landfill acreage for this site if a landfill license is issued, DHES requested the letter of March 17, 1993 from the Board to verify the status of the application.
G-3	See responses to comments G-1 and G-2.

Letter and Comment No.	Response
G-4	Landfill licensing applications are constantly modified during the review process. This flexibility is important as the location, design, and operation plans change in response to issues identified by the DHES review, public input, or changes in regulations. The proposal considered in this review is the current application for an 80-acre landfill within a 320-acre land parcel. DHES disagrees that consideration of an 80-acre landfill is a distortion of the facts and believes the comparison of alternatives is consistent with the situation. Any move to expand the proposed landfill in the future into the remaining acreage of Site E would require a new application, license review and appropriate MEPA process to be conducted on that proposal. Since the projected life of the proposed 80-acre landfill is 50 years, it is unreasonable to try to project what solid waste disposal measures will be utilized at that time or whether landfilling of solid waste will even be allowed that far into our future.
G-5	A modification to the liner design (since publication of the DEIS) has been submitted to DHES for the Site E License Application to comply with the new state and federal regulations (Subtitle D). See Section 2.2.1 of the FEIS for details. However, this may not be the final engineering design for the facility, if constructed. DHES believes it would be an undue financial burden on license applicants to develop a final engineering design for a license application. Rather, DHES reviews the proposed design to ensure compliance with applicable federal and state rules and regulations, and for appropriateness of the design based on a proposed facility location. A licensing decision is based on the "preliminary" designs. However, construction of the facility could not commence without DHES' review and approval of final design specifications. According to communication from Lewis & Clark County to DHES (Board of County Commissioners 1993) a contract for final design of the landfill has been awarded to Damschen & Associates for a not-to-exceed amount of $220,000. Engineering and consulting fees to design and oversee construction of a landfill were included in the cost estimates developed for this EIS. Tables 4.12-1 and 4.12-2 have been modified to better define and explain elements used in the cost estimates.
G-6	DHES disagrees with this comment. The analysis of impacts reported in the DEIS including the socioeconomics and costs compared within the tables cited were

Letter and Comment No.	Response
	done with the stated assumption that any alternative utilized would have to comply with the Subtitle D rules. The proposed action was analyzed for the applied for 80-acre landfill (see response to comment G-1).
G-7	DHES generally agrees with the comment concerning history of the application, Subtitle D rules and effective dates, cost requirements for Subtitle D compliance, and the public statement regarding the County's intention to comply with Subtitle D. The Board of County Commissioners has reiterated their intention to comply with Subtitle D requirements (see letter from Board to Jon Dilliard, July 9, 1993). However, please note that the new state rules for solid waste management have been finalized and became effective October 9, 1993. These rules contain essentially the same technical compliance as Subtitle D.
G-8	As stated previously, the costs of compliance with Subtitle D requirements were considered in the DEIS. DHES considered the request for a supplement to the DEIS under ARM 16.2.636. It was decided that no supplement was warranted since the changes that may have occurred in the design would not have a significant bearing on the proposed action or its impacts that would change the basis for the decision.
G-9	DHES disagrees and believes the DEIS and the FEIS comply with the required description of the impacts on the quality of the human environment including economic benefits and costs.
G-10	Subsequent to the July 30, 1992 letter from Woodward Clyde Consultants (WWC) to Mr. Dilliard, a meeting between program representatives and WWC discussing the economic and socioeconomic needs of the EIS was held. During that meeting it was decided that WWC should include in the economic analysis all costs associated with the development of all alternatives including the probable impacts of the federal Subtitle D regulations. Those cost impacts and the information available were included in the analyses contained in Section 4.12 of the Draft EIS. Where necessary,Section 4.12 of the FEIS has been revised to include updated information and costs and the associated tables have been revised to reflect those costs. Please see revised Section 4.12.

Letter and Comment No.	Response
G-11	DHES disagrees and believes the DEIS and FEIS adequately describe the impacts of the proposed action for the issues raised during the scoping process.
G-12	The costs of constructing and operating a landfill at Site E and Site A were developed using the County's estimates in comparison with values found for general landfill development in an extensive literature search. The current estimates for a Site E landfill developed by the County's consultant, Damschen & Associates (1993), can be reviewed in Appendix B.
G-13	Thank you for the submitted cost information. The Blue Ridge Services cost break down is for a landfill that has a projected total capacity of 200,000 tons, an anticipated daily volume of 27 tons (at 365 days/year with an annual volume of 10,000 tons), and a projected active life of 20 years. Site E and Site A would have an approximate projected capacity of 2,000,000 tons, an daily volume of 110 tons, and projected active life of 50 years. The construction costs of landfills are dependent on site characteristics and the operational costs are very dependent on volumes of waste accepted, total capacity, and projected active life. The Glebs article was utilized in the revision of Tables 4.12-1 and 4.12-2 in the FEIS, as well as numerous other sources, see Section 4.12 of FEIS. Please note that the Glebs article had a lower estimate of operational costs for landfills ($8 per ton) than the number used in the comparisons in the DEIS. This was rectified in the revision for the FEIS.
G-14	The description of the impacts to the human environment required by MEPA in the area of costs for each alternative (including the proposed action) were presented in Section 4.12 of the DEIS and the FEIS. The comparison utilizes estimated costs for the proposed Site E landfill based on the industry estimates for the type of design and operation in compliance with state and federal requirements as applied for by the applicant. Site A and CCSS landfill alternatives have been estimated utilizing the same standards with no proposed designs available. The No Action Alternative of hauling the City and County's waste to the High Plains Landfill is estimated based on the terms of the current City contract. This cost is subject to certain increases and the short term (potentially 7 years) of the contract. The comment is correct that the estimated cost of the City of Helena Transfer Station escalated during the time of planning through construction. The initial

Letter and Comment No.	Response
	The comment is correct that the estimated cost of the City of Helena Transfer Station escalated during the time of planning through construction. The initial estimate of costs of the transfer station was for a facility to serve only the City residents, the cost increased with the expansion of the proposed facility to include the County residents. The Federal Aviation Administration and Carroll College had certain requirements that modified the design with additional cost. Also, the final bond included funding the transfer truck and trailers and a percentage of overfunding required by the bonding agency (Board of County Commissioners 1993a). The cost estimates present in the DEIS and FEIS were developed for constructing and operating a Subtitle D complying landfill. Increased regulation could increase costs, however each alternative landfill would likely have similar requirements and additional costs for compliance.
G-15	The County's consultant prepared a cost projection/breakdown for the operation of the proposed landfill and presented it to the Scratch Gravel Refuse District Board in July of 1993. DHES requested a copy and received one in August of 1993. A copy is provided in Appendix B. DHES believes an adequate cost comparison has been provided in both the DEIS and the FEIS. See response to comment G-8 concerning the request for a supplement.
G-16	The capital costs of a landfill at Site E has been estimated in Table 4.12-1 of the FEIS at \$9.1 to \$16.7 million for the proposed 80-acre landfill. The increase from the estimate in the DEIS is due to including the costs of constructing final cover or caps for the waste disposal areas in the construction cost breakdown (Table 4.12-2) rather than in the operation cost estimate.
G-17	Financial assurance for closure and post-closure care for landfills, which is required by state rules and Subtitle D as of April 9, 1995, is estimated in the line item in operational costs of Table 4.12-1 (\$30,000 to \$100,000 per year). This estimate is based on the building of a trust fund to cover the cost of these requirements as allowed under both state and federal rules. However, the U.S. EPA has yet to promulgate the financial assurance rule that defines local government test or guarantee for coverage of this requirement. Depending on the requirements of that future rule this estimated cost may be reduced or eliminated.

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G-18	The County's cost estimate projects a series of bond issues during the life of the proposed landfill to fund construction (including closure costs). See Damschen 1993 in Appendix B. The initial 20-year bond is projected to be for $3.25 million.
G-19	The County has projected a total tipping fee for the proposed landfill at $22.50 per ton initially. This figure includes debt service. See Damschen 1993 in Appendix B.
G-20	Installation of the methane monitoring system at the proposed landfill is estimated at $5,000 to $10,000 in Table 4.12-2. Annual monitoring of methane at the landfill would cost between $2,000 to $5,000 a year. The County has budgeted $10,000 for initial installation and $2,000 a year for monitoring (Damschen 1993). Monitoring is required by state and Subtitle D rules; if a problem is identified corrective action must be initiated. If proposed rules under the Clean Air Act are implemented that require active landfill gas controls, those estimated costs are explained in Section 4.12 (page 4-60).
G-21	The County has committed to upgrading Lake Helena Drive and a portion of Deal Lane for the development of the Site E landfill at an estimated cost of $320,000 (see Table 4.12-1 Road Improvements). No upgrade of York Road has been discussed.
G-22	The cost of compliance with the federal Subtitle D rules has been assumed in the cost estimates in both the DEIS and the FEIS.
G-23	The cost estimate for a composite liner and leachate collection system for the 80-acre site is $4.8 to $8.0 million (see Table 4.12-2).
G-24	The composite liner and leachate collection system cost is estimated to range from $50,000 to $100,000 per acre. The County has budgeted $100,000 per acre for this cost in Damschen 1993 (see Appendix B).
G-25	The County has revised the liner design to comply with the Subtitle D requirements; the proposed final cover needs to be revised and the plan for

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	methane monitoring has not yet been submitted. The cost for compliance has been included in the cost estimates developed for the MEPA process.
G-26	The cost estimates have been developed under the assumption that engineering costs for design are included in the item costs.
G-27	Please refer to Table 4.12-4 for that comparison. The purchase price for the site is of minor significance for the cost of developing, construction, and operating a modern landfill. Other factors become much more significant, such as location restrictions (i.e. proximity to airport runways) and availability of low permeability soils (i.e. clay) on site for liner construction.
G-28	See response to comment G-19.
G-29	See response to comment G-30
G-30	The July 30, 1992 letter from Woodward Clyde Consultants (WWC) to Mr. Dilliard discussing the need for additional hydrogeological data on Site A or Site B was prepared during the initial development of the DEIS and prior to the establishment of the alternatives to be considered. Also, at the time of that letter, there had not been any substantial research on existing available data on the sites. Subsequent to this letter Site B was eliminated from consideration as an alternative because of poor geological conditions and the potential unavailability of the land (see Section 2.1.5.2 of the FEIS). When the DHES investigated the existing available hydrogeological data in the area of the remaining site (Site A), it was discovered that several private wells and the associated well logs provided correlatable information on the geology and hydrogeology of the area. From that information the DHES was able to develop baseline data on the site. To confirm or reject this information the DHES drilled a test boring at Site A in December 1992 (See Section 3.2.2.2 of the FEIS). The test boring confirmed the information used to develop the baseline data at Site A to within a few feet of the projected levels. With the data confirmed the DHES believes that it has sufficient information to analyze Site A as a alternative site and has used that information to conduct a comparable analysis of the reasonable alternatives considered in the EIS.

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G-31	The DHES does not dispute this comment's point that Site E was never ranked as the best site by the Solid Waste Study Committee (SWSC). This point was clearly mentioned in Section 2.1.3.2 of the DEIS and the FEIS. However, the DHES does not believe that Mr. Miller's offer to negotiate a land trade with ". . . some small compensation for the disturbance of soil on Site E" provides any justification for a reanalysis of this alternative. Mr. Miller's offer does not provide any concrete value for the "compensation" beyond his original Site A price of $400,000.00 which has been used in the analysis.
G-32	The DHES considered the privatization of waste disposal for the study area through the selection and analysis of the CCSS Landfill, a privately owned and operated landfill, as an alternative site, Alternative 3 to the proposed action (See Sections 2.1.5.2 and 2.1.5.3 of the FEIS). As stated in the text of Section 2.1.5.2, this alternative has been given full consideration in the EIS. (For a discussion transporting wastes out of County see response to comment G-33.)
G-33	The DHES does not agree with the comment that no consideration was given to transporting wastes out of County (See comment G-32). This option was developed as a portion of the No Action Alternative which included the upgrading and continued use of the existing landfills and the export of wastes (see Section 2.1.5.5). A discussion of potential impacts of transporting waste to an out-of-county disposal site (including the High Plains Landfill near Great Falls) is contained in Section 2.6.2 of the FEIS. Further detailed analysis of the impacts on a receiving facility for wastes transported out-of-county, such as the High Plains Landfill, is not reasonable within the scope of this EIS since the receiving facility can be transitory. Depending on contract terms, periodic contract negotiations, tipping fees, transportation costs, interlocal agreements, liability concerns, and the receiving facility's compliance and licensing status the wastes being transported out-of-county could be delivered to a different facility, to multiple facilities, or even to a facility out-of-state at any given time. However, for the purposes of a comparative analysis of costs associated with the various alternatives, including transporting wastes out-of-county, the current costs of exporting wastes to the High Plains Landfill near Great Falls have been fully incorporated in the socioeconomic analysis of Section 4.12 of the FEIS under the No Action Alternative. All costs in this section incorporate appropriate

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	compliance with federal Subtitle D and state regulations as the sites are currently configured.
G-34	See response to comment G-33.
G-35	Thank you for your comment. Please refer to response to comment G-33.
G-36	The DHES believes that the FEIS has discussed and analyzed reasonable alternatives to the proposed action along with all available and appropriate information on each and has chosen its preferred alternative based on the thorough analysis of those alternatives.
G-37	See response to comment G-36.
G-38	The analysis of impacts reported in the DEIS and the FEIS including the socioeconomic and costs were prepared with the stated assumption that the proposed action and any alternative site would be required to comply with the provision of the Subtitle D regulations. To this extent, the only thing that has changed between the preparation of the DEIS and the FEIS is that the assumption has become a fact. Therefore the DHES believes that since the requirements of Subtitle D were fully considered when the alternatives where analyzed the comparison remains valid.
G-39	The DHES disagrees with the commentor's assertion that the difference in conversion rates of land use from farming to industrial (landfilling) between the CCSS Landfill and Site A and E is significant. Land use impacts for each site were analyzed in Section 4.10 of the EIS. In the case of both Site E and Site A the loss of acreage from the current land use of farming would not represent a significant decrease in the total amount of farmland in Lewis & Clark County. In the case of the CCSS Landfill, the expansion of the existing landfill represented an incremental increase to the existing disturbances. A summary of the potential environmental effects resulting from the implementation of the five alternatives in both the DEIS and FEIS is contained in Table 5.1-1 of Chapter 5. Included in this table are the impacts of land use changes. As stated in Section 5.5 the DHES' consideration of a preferred

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	alternative included the factors discussed within the text of Section 5.5 and included the overall analysis of all alternatives to the proposed action. The text of this section was not designed to be a rehash of all the information already presented within the EIS, but was intended to discuss the significant impacts concerning the alternatives which factored into the DHES' preferred alternative selection.
G-40	Montana's policy to utilize private industry to the maximum extent possible in functions related to solid waste management facilities cannot be construed to imply that private industry must be used to the exclusion of better, more economical, or more environmentally sound options. The DHES considers the policy of "privatization" to be a judgmental factor for decision making when all other factors are determined to be equal. As discussed in Section 2.1.5.2 the DHES did use this policy as a decision making tool to include the CCSS Landfill in the list of alternatives to be considered. However, as mentioned in Section 2.1.5.3 the DHES did not include "privatization" in the EIS because ". . . the management of the facility is not the primary issue of environmental concern; rather, the location of the landfill has been the main point of dispute". Therefore the DHES considers the primary issue to be addressed by the EIS in the development and consideration of alternatives to be the best location for the disposal of the study area's wastes.
G-41	The DHES agrees that additional subsurface characterization would be needed, if a detailed subsurface characterization were in order for this analysis. However, as discussed in response to comment G-30 the DHES believes that with the existing and collected information it has sufficient baseline information to analyze Site A as an alternative site and has used that information to conduct a comparable analysis of the reasonable alternatives considered in the EIS.
G-42	See responses to comments G-30 and G-41.
G-43	The DHES disagrees with this comment. The DHES believes that sufficient site specific data on the alternatives was used for the analysis. For further discussion see responses to comments G-30 and G-41.
G-44	See response to comment J-8.

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G-45	DHES disagrees and believes the DEIS and FEIS have provided a consistent comparable analysis of the proposed action and alternatives as required by MEPA and the DHES rules implementing MEPA.
G-46	DHES disagrees, the additional 109 acres originally planned for phases II and III of the original application by the County have been eliminated from consideration for a landfill license (see response to comment G-1). Licensing this additional acreage and construction of a landfill 50 years from now cannot be construed to be a reasonably foreseeable impact.
G-47	See responses to comments G-1, G-4, and G-46.
G-48	See responses to comments G-1, G-4, and G-46.
G-49	This comment has confused the DHES's selection of its preferred alternative with a statement of the DHES's proposed decision. Such a statement is not required in the EIS and is not normally included, however, the MEPA/EIS process ultimately concludes in the issuance of a Record of Decision (ROD). To this end, the DHES chose to include a statement of a proposed decision in this section of the EIS to inform the reader as to what direction all the information and conclusions were leading. In a phrase, the DHES decided to "lay all the cards on the table". This was not a part of the DHES' selection of a preferred alternative, but a probable conclusion to the findings. As discussed in Section 5.5 of the DEIS, the DHES' selection of a preferred alternative was based on the consideration of all the information analyzed within the DEIS. This selection of the preferred alternative was not tied to Site E's ability to meet licensing requirements as inferred by the commentor, but the DHES' proposed decision was. Therefore, the DHES believes that it has properly chosen its preferred alternative based on a thorough analysis of the environmental impacts. Since the inclusion of the proposed decision in the DEIS has proved to be confusing to some readers, it has been removed from the FEIS. (See revised Summary and Section 5.5 of the FEIS.)
G-50	See response to comment G-49.

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G-51	As discussed in response to comment G-5, the proponent has proposed a liner design which the DHES believes is acceptable to comply with the requirements of the federal and state regulations. Where appropriate the FEIS has been revised to reflect that design including Sections 4.1.1.2 and 4.2.1.2. Also as mentioned in response to comment G-38 all impacts and costs were analyzed with the assumption that all sites would comply with the requirements of the new Subtitle D and state regulations. It must be noted, however, that with the exception of Site E, specific liner designs cannot be analyzed within the EIS. Since both the federal and state regulations establish performance standards for the protection of the environment, it is possible for any given landfill to use a multitude of different designs to meet the performance standard required. A specific liner design has not been proposed for Site A and the CCSS Landfill outline for compliance with Subtitle D requirements received by the DHES does not contain any specific design information. However, for the analyses of impacts within the EIS it is assumed that all alternative sites would be designed to meet the minimum performance standards of the regulations.
G-52	No specific analytical deficiencies were cited by the commentor. DHES believes the level and detail of environmental impact evaluation is sufficient, and meets the requirements set forth in MEPA and DHES' rules implementing MEPA.
G-53	DHES considered the request for a supplement to the DEIS under ARM 16.2.636. It was decided that no supplement was warranted since the changes that may have occurred in the available information did not constitute: (1) a substantial change in the proposed action or significant new circumstances, including information bearing on the proposed action or its impacts that change the basis of the decision. The agency determined that there was not a need for substantial assitional information to evaluate the impacts of the proposed action or reasonable alternatives.
G-54	DHES disagrees, and believes the Draft and EIS meets the requirements set forth in MEPA and DHES' rules implementing MEPA.

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Cleber Amundson Letter	
H-1	The DEIS does include a discussion of the water resources, both surface water and ground water, located to the east of Site E. Water resources identified in the DEIS to the east of site E include the drainages, irrigation canal, springs, and water wells. The study area for the DEIS and FEIS is the entire Helena Valley and the introductory sections in the discussion of various resources focuses on the resources known within the valley. Specific resources and the potential impacts to those resources in the vicinity of each alternative landfill location was explained in each section devoted to the individual sites.
H-2	Cedar Creek although not named or shown on maps in the DEIS was not ignored, since the discussion of impacts to ground water and surface water resources included those resources downgradient of Site E including the springs to the east of Site E that feed Cedar Creek and the drainages to the east of Site E. Please see response to comment F-2 and Section 3.3.2.1 of the FEIS concerning identification of Cedar Creek. It is agreed that differing estimates have been made concerning the amount of flow of one spring the feeds Cedar Creek. The commentor does not specify which spring is being referred to, but all of the springs east of the landfill, in or near Cedar Creek, are likely to have variable discharge volumes. The flow of water from the springs is probably dependent on the time of year, the amount of recent precipitation, ground water level, and flows in nearby irrigation channels. It is also agreed that in recent years it is apparent that at least one spring (S-3) does flow year round. However, impacts of leachate to ground water from a landfill have been addressed in the DEIS in Section 4.2.1.1 and since springs are a surface water expression of ground water the same analysis of the potential impact to ground water resources (see response to comment D-6) would apply to the spring and creek, if the hydraulic connection does in fact exist between that spring and the ground water beneath Site E. See Section 4.2.1.5 for mitigation measures to help reduce the potential for ground water contamination.
H-3	Mitigation measures for impacts to ground water resources were identified in Section 4.2.1.5 of the DEIS. The improvement of the proposed design for landfill liner construction should greatly alleviate concerns about potential contamination of ground water (see Section 2.2.1.1 of the FEIS). The landfill licensee will be required to monitor ground water quality at wells located just outside the landfill

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	disturbance area. Chemicals to be analyzed in the water samples are identified in Section 2.2.4. If water quality sampling indicates ground water contamination, the licensee will have to identify the extent of the problem and submit to DHES a plan for corrective action (ground water containment and/or cleanup) and implement the plan when approved by DHES. If a ground water contamination problem was identified at any time with the potential to affect such distant receptors as the springs to the east, DHES would require that selected springs east of the landfill be monitored for the same compounds found to contaminate the ground water. Exact mitigation costs are not calculable in anticipation of contamination of ground water resources, but ground water cleanups can cost millions of dollars.
H-4	It is not agreed that the springs east of the landfill are not dependent on irrigation activities. Irrigation water is likely a factor in the volume of flow for all springs in the Cedar Creek drainage. The issue remains as to what other potential sources of water might be available to these springs, particularly spring S-3. It has not been conclusively shown that ground water from beneath Site E contributes to this flow. Other potential sources of water include ground water recharge by shallow percolation of local rainfall or snow melt or even ground water flow from the southwest and the Helena Regulating Reservoir is a possibility. See Section 6.5.2.1 for a discussion of the requirements of the MEPA process.
H-5	Costs in Section 4.12 and associated tables have been revised to clarify the information presented and to allow easier comparisons. See response to comment G-14.
H-6	The costs estimates are not intended to be definitive, but estimates of basic costs derived from the listed references for purpose of comparing alternatives. See response to comments H-5 and G-14. Appendix B contains the County's itemized cost estimate for the proposed landfill (Damschen 1993).
H-7	The estimated cost range from Walsh 1993 is very wide due to the lack of knowledge of what the possible regulatory requirements will be and how they may be implemented in a site-specific situation. Understanding of these costs estimates beyond the level presented in the DEIS and FEIS requires the reader to examine the references from which the estimates are derived.

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H-8	See response to comment H-6.
H-9	See responses to comments H-6 and H-7.
H-10	This is a correct description of the text.
H-11	The current license application for Site E includes only so-called Phase I (see response to comment G-1), approximately 80 acres, for use as a landfill. The information on the site selection process is provided in the DEIS for informative purposes. MEPA requires an analysis and description of impacts, not second guessing the County's decision to purchase the proposed site. Other potential uses of the additional acreage include buffer area for the proposed landfill, composting facility, or leased agriculture use.
H-12	See response to comment H-11.

Helen Amundson Letter

I-1	It is unfortunate if the meetings during the scoping process for the EIS left you with an incorrect understanding of the purpose and goals of the MEPA process. Please see the response to the general comment on MEPA in Section 6.5.2.1 in the FEIS.
I-2	The cost analyses in the Draft EIS apparently caused confusion for a number of readers; particularly when comparing capital costs for new, County-operated sites (E and A) versus private development of the existing CCSS facility. It is true the County (and ratepayers) would not have to initially outlay a large sum for use of the CCSS facility. The owner of that landfill would pay for new construction, retrofitting to comply with Subtitle D, etc. However, the owner would have to redeem these costs through the tipping fees. Therefore, the actual cost comparisons should be based on a total charge per ton for refuse disposed of. This comparison should take into account all expenditure factors. Therefore, the CCSS facility does not represent an alternative with a clear cost advantage. Tables 4.12-1 and 5.1-1 have been modified to show this point clearly by indicating the

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	cost per ton of disposal and the cost per ton of disposal and transportation for all alternatives.
I-3	See responses to comments F-2, H-2, H-3, and H-4.

Jeff Claassen Letter

J-1	Thank you for your comment.
J-2	The initial comment seems to suggest that the value of our water quality is made even greater by the semi-arid climactic conditions in the study area. In other words, because our area does not have an overabundance of water resources, we need to be especially cognizant of potential risks. We would agree with the intent of this statement. The commentor raises a siting issue which characterizes ground water downgradient from the CCSS facility and Site A has having experienced some detrimental impacts from past industrial activities, while the ground water resources near Site E have not. This does not mean, however, that the ground water near Site E is pristine, it may simply reflect that no obvious point sources of pollution exist, such as do in the East Helena vicinity. For instance, farming and ranching on and near Site E property may have added nutrients such as nitrates, pesticides, or other agrichemicals to the ground water. To our knowledge, no data is available near Site E concerning these possible pollutants. Nevertheless, to simplify, the comment seems to be, why contaminate another area of the aquifer (near Site E) when one area is already negatively impacted (near CCSS and Site A)? Montana law and regulations do not allow new activities to further pollute ground water that has already been degraded to some extent. This line of reason also assumes the a new landfill will impact ground water. It also raises an ethical question of environmental equity when a location for a potential environmental hazard is sited in an area already environmentally degraded by past activities, because of that degradation, therefore, subjecting residents of that area to further risk. Although the proposed landfill does have recognized possible impacts; it is DHES' belief, however, that the siting, design, and operation

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	requirements of the state and Subtitle D rules provide a high degree of protection to environmental resources.
J-3	It is agreed that Site E is located on a topographic divide and straddles a surface water hydrologic divide between watersheds. The surface water runoff controls required of new landfills and proposed for Site E are designed to protect these drainages from detrimental environmental impacts. See response to comment J-4.
J-4	The proximity of surface water bodies to Site E has been adequately described in Section 3.3.1. Additional text has been added concerning Cedar Creek .
J-5	The commentor's observation of flow at spring S-3 was in fact noted in Section 3.3.2.1 of the Draft EIS. The observation made by Mr. Wallace (project manager for the consultant developing this EIS with DHES) occurred after the Draft EIS had gone to print for distribution, and could not be noted in the Draft. However, it has been added to the Final EIS. See responses to comments D-6, H-2, H-3, and H-4 concerning the possible connection between ground water at Site E and springs east of the site. Also see Section 4.3.1.1.
J-6	The most recent cost analysis and budget by the County (Damschen 1993) was considered in the revision to the cost estimates described in Section 4.12 and are reprinted in Appendix B of the FEIS.
J-7	The EIS estimate of cost for landfill operation and maintenance is presented as a range purposely, since a firm number is not possible when there is no design or plan of operation for the proposed landfill, as is the case for Site A and CCSS Landfill. DHES is uncertain as to the reasons for the difference in the estimated cost of operation of Site E and Site A in the Phase II Siting Study.
J-8	The commentor raises a legitimate concern over potential regionalization of the proposed landfill and the impact of additional hauling routes for the new service areas. With interest in the use of a landfill in Lewis & Clark County shown by both Broadwater and Jefferson Counties, the proponent was asked if this option should be considered in this licensing action. Lewis & Clark County responded clearly, that at this time, the only service areas to be included in the application

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	for license of this landfill would be the City of Helena, City of East Helena, and Scratch Gravel Refuse District. Therefore, the DEIS and the FEIS have evaluated the transportation issues related to servicing these areas. If the landfill is licensed and at some time in the future the County wishes to expand the service area beyond the previously identified areas. The license must be modified with public involvement as required under MEPA.
J-9	Thank you for your comment. Estimated transportation costs have been included in the revised Tables 4.12-1 and 5.1-1 for all alternatives considered.
J-10	DHES agrees with the comment that parts of York Road have significant residential development at this time and that additional residential development is likely.
J-11	Thank you for your comment. It is agreed that York Road is a major traffic artery of the Helena Valley and that portions have only two lanes without shoulders. However, several stretches of this road have been recently upgraded from that condition (i.e. Warren School corner) and as the eastern part of the valley continues to be developed, more road improvements will occur. See Sections 3.9 and 4.9 of the FEIS and response to comments O-5 and O-6.
J-12	In fact, using a developed size of 80 acres at Site E provided a more comparable impact analysis with the other sites, since the area to be disturbed would be similar. This also made the lifespans similar. It is pointed out again, as it is in Section 4.12, that the purchase price of Site E vs. Site A is relatively unimportant in the overall economic analysis of the landfill, since ultimate development and closure costs will be many millions of dollars. In addition, it is DHES' understanding that there has been no definitive change regarding Jefferson County's concerns regarding development of landfills in the northern part of that County to serve out-of-County users.
J-13	The scope of this EIS did not include economic forecasting for land uses, so discussions of potential development and land value impacts are speculative. However, there has been documentation to show that residential development in the vicinity of a well-designed and operated landfill would be compatible (Bleich, Findlay, and Phillips 1991). Also see responses to comments M-8, A-1, and C-1

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	and revised Section 4.12.1.1 of the FEIS. Property immediately adjacent to the landfill might be less desirable for residential development without a suitable buffer zone around the landfill. A developer has been offering properties near the golf course, which is itself apparently expanding in anticipation of higher use. Further, residential development is clearly not without environmental consequences and could have a greater impact on some resources, such as wildlife (loss of access to habitat and habitat destruction) and ground water (release of nutrients from septic systems, improper use of pesticides and herbicides) in a much larger area than the proposed action.
J-14	Becraft (1958) discusses slightly radioactive anomalies that were studied in an area north of Deal Lane. Mr. Becraft states that these radioactive anomalies in Western Montana may warrant prospecting. The area near Deal Lane had lower radioactivity than areas studied near Winston, Montana. DHES does not have access to proprietary geological reports of the companies cited by the commentor, but it should be pointed out that the market for uranium today has changed dramatically from the 1950's and that no actual mining of radioactive ores that were cited in the report have occurred in the area. As discussed in Section 4.1.1.1 of the FEIS, the geological strata that contained the radioactive material is located at significant depth beneath Site E which would further limit its economic value.
J-15	See Section 4.1.1.1 of the FEIS.
J-16	Litter and odor are two potential impacts of landfills in general. Prevailing wind direction for the entire Helena Valley and all landfill locations considered was presented by the windrose of the Helena Airport in Figure 3.4-1. The prevailing wind direction from the west would be the same at each alternative. Site E was identified as having the closest residences of the alternatives consideration, though not very close to the eastern boundary. Proper landfill operation considerably minimizes the occurrence of these potential impacts and is required by state rules.
J-17	There was no intent to relate the technical merits of Site A to the amount or degree of public opposition to the site. There was in fact a considerable amount of outcry from persons living in the vicinity of Site A when it was floated as a

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	viable landfill candidate. This is equally true of Site E. The commentor fails to note that the Draft EIS also discusses ". . . significant opposition from the public." relative to the Environmental Assessment on Site E (see Section S.1.3). The ongoing degree of concern over, and opposition to, Site E has been duly noted in Section 6.2 of this Final EIS. We find no basis for the final part to this comment, suggesting that certain individuals would have or had more influence in the decision-making than others.
J-18	The only justification of which DHES was aware was presented in Section 2.1.3.2 of the Draft EIS. The County, in response to comments on the DEIS, maintains that Site A was rejected for economic and environmental reasons, primarily the location of the site in a recharge area of the Helena Valley aquifer (Board of County Commissioners 1993).
J-19	Thank you for your comment. The amount and degree of study which has gone into determining whether or not to grant Lewis & Clark County a license to construct and operate a solid waste landfill is unprecedented in Montana. DHES has the responsibility to conduct licensing considerations in an unbiased manner, and is confident that they have fulfilled their licensing responsibilities, and MEPA evaluation, in accordance with Montana statutes. See also the general comment response on MEPA process in Section 6.5.2.1 of the FEIS.

Terri Claassen Letter

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K-1	See response to comment F-1. Additional cost information has been added to this Final EIS which will hopefully clarify the confusion and concerns expressed over the cost comparisons in the Draft EIS.
K-2	See response to comment G-7. The Board of County Commissioners have reiterated their intention to comply with Subtitle D requirements, regardless of the effective date of the regulations (Board of County Commissioners 1993). The revised landfill design submitted by the County (after publication of the Draft EIS) incorporates a number of engineering features for environmental protection, including a leachate collection system, low permeability subgrade, synthetic lining, and use of swelling clays to assist in moisture control and sealing of cracks or

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	leaks. DHES believes that all parties involved in these debates want a landfill which is significantly safer than the Scratch Gravel landfill.
K-3	We would agree that Site E is not a ". . . low impact area to contaminate". However, no sites exist in this area which would constitute a "low impact area"; all are likely to have the potential to impact residential drinking water wells, surface water bodies, and/or municipal water supplies. The emphasis in Subtitle D is to prevent placement of landfills in high risk or vulnerable locations, and to use best available engineering to reduce the potential for contamination to leave the confines of the facility. The designs accepted under Subtitle D regulations may not constitute "permanent engineering solution(s)," but they do represent state-of-the-art technology.
K-4	Thank you for your comment, and for the attached essay. We believe this is an excellent reminder of the problems faced when government or private industry attempt to communicate with the constituencies most likely affected by our actions.
M.D. Lawrence Letter	
L-1	We hope that the additional text and information added to this Final EIS helps to alleviate some of your concern regarding potential threat to surface water and ground water posed by a Site E landfill.
L-2	See responses to comments F-2, H-2, H-3, and H-4, and additional text in Section 4.2.1 of the FEIS.
L-3	We agree that the studies conducted to evaluate Site E will not preclude contamination of ground water. However, the information obtained in these studies, combined with specifics on the proposed design for the landfill, have convinced DHES that the potential for contamination of ground water is very low.

Letter and Comment No.	Response
Tom Morrison Letter	
M-1	Thank you for your comment. We recognize your point that the costs calculated to construct and operate a new landfill can have ramifications beyond the issue at hand. We would also like to point out the obvious difficulty and impracticability in quantifying those indirect costs.
M-2	Please note the revisions to the cost analyses in Chapter 4. More detailed information has been added to address concerns that the costs in the Draft EIS could not be evaluated for merit. It should be noted that the Draft EIS did not rely on the economic analyses of the Site E proponent when estimating construction and operational costs, except for such relatively consistent items as purchase price, road improvements, and basic structural features as fencing and well installation. The majority of the costs estimated for construction and operation of a Subtitle D compliant landfill were calculated using standard references for this industry.
M-3	Unfortunately, the capital cost figure of $13.3 to $21.6 million from page 4-60 of the DEIS was a typographical error in the document. The correct figure from Table 4.12-1 was $6.2 to $9.7 million. The revised cost estimates in the FEIS were increased by including the construction cost of final covers or caps of the waste disposal areas required for closure in the capital cost estimates rather than in the operation costs which was done in the DEIS. The FEIS estimate of capital costs for the entire life of Site E was $9.1 to $16.7 million. This figure is not a reflection of start-up costs, that would be considerably less. The commentor is incorrect in that capital costs with the 10% contingency were estimated for all alternatives considered in both the DEIS and the FEIS. However, as was explained the CCSS Landfill alternative and the No Action Alternative of hauling the waste to another licensed landfill outside of the County would not have required capitalization costs by the City or County, but the owners of these facilities would have to bear this burden and recoup their costs in the tipping fees charged for disposal (see Section 4.12 of the FEIS).
M-4	See response to comment I-2. For the County's estimate of start-up costs see Damschen 1993 in Appendix B.

Letter and Comment No.	Response
M-5	See response to comment H-7 and Section 4.12 of the FEIS.
M-6	The cost estimates provided include a capital cost of $320,000 for road improvements for Site E (see Table 4.12-1). DHES is unaware of any road improvement made to the haul route in anticipation of the operation of the proposed landfill at Site E at this time. The reconstruction of York Road near Warren School was planned and constructed outside of the landfill siting action. Other road improvements may be related to mining activities at Site E, permitted by DSL.
M-7	See response to comment M-8.
M-8	Studies of residential transactions in neighborhoods adjacent to landfills have indicated a well-designed and operated landfill has no statistically measurable impact, either positive or negative, on surrounding property values (Bleich, Findlay, and Phillips 1991). Also see revised Section 4.12.1.1 of the FEIS. Additionally, local evidence appears to confirm the conclusion of the study. Both residential and recreational properties located adjacent to or in near proximity to the City and the County landfills have continued to undergo development during the life of these facilities. Specific examples include the Bill Roberts Golf Course near the City of Helena Landfill and the residential development adjacent to the Lewis & Clark County Scratch Gravel Landfill. Based on comments received during the Draft EIS comment period, it does not appear that either landfill has negatively affected the property values of nearby residences. (See comments A-1 and C-1) Based on this evidence the DHES does not believe that the proposed Site E Landfill, if property operated, would have any effect on neighboring property to constitute a wrongful taking.
M-9	See response to comment M-8.
M-10	The municipal Bill Roberts Golf Course mentioned is located adjacent to the City of Helena Landfill. See comment C-1 and response to comment M-8.
M-11	Tables 4.12-1 and 5.1-1 have been revised to allow comparison on a per ton cost for each alternative for disposal alone and for disposal and transportation combined (see response to comment I-2).

Letter and Comment No.	Response
M-12	See response to comment G-14.
M-13	A copy of the County cost estimate/budget for the proposed landfill prepared by their consultant is reprinted in Appendix B (Damschen 1993).
M-14	See responses to comments G-14 and D-12.
M-15	DHES disagrees. See response to comment G-14.
M-16	DHES believes that analysis has been present in the DEIS and the FEIS.
M-17	No response required.
M-18	No response required.
M-19	Thank you for your comment. DHES believes this Final EIS meets all requirements under MEPA and rules implementing that Act.
M-20	DHES knows of no factual basis for this charge.
Janet Tenesch Letter	
N-1	If licensed, the proposed landfill at Site E would be required to comply with all Subtitle D and state rules regulating solid waste disposal at landfills.
N-2	Costs in the EISs were estimated assuming compliance with Subtitle D requirements.
N-3	DHES is the regulatory agency enforcing the Montana Solid Waste Management Act and the administrative rules implementing that law.
N-4	Thank you for your comment. Please note that the EIS does not say that private wells "will" be impacted at Site E, but that there would be the "potential" for private wells to be affected if ground water becomes contaminated.

Letter and Comment No.	Response
N-5	It is DHES' position that the activities noted by the commentor (wildlife viewing, various water sports on the lakes) would not be significantly impacted by the presence of a landfill at Site E. Proper operation of the landfill to control litter and odor, and development of a perimeter visual screen, could reduce the degree of impact. Any disruption of the existing environment will modify the environmental resources (see response to comment no. J-13) to some extent, including residential development.
N-6	Logistical obstacles would primarily be transportation related. The long transport distance (over 100 miles) and potential for severe weather during many months of the year could result in periods when waste transport is impossible. See response to comment D-12 concerning rail transport. Political obstacles are uncertain, but could be anticipated. Future residents and elected officials in Missoula or Great Falls may not appreciate having waste imported into their local landfill, since it would result in a shorter facility lifetime to serve the local community.
N-7	The estimated costs to use the Great Falls (and Missoula) facilities were based on bids received by the City of Helena,approximately two years ago. These numbers reflect the actual costs proposed by the facility. However, early in 1993 the City of Helena once again issued a request for bid, and the responses from both Great Falls and Missoula were quite a bit lower. The current costs to be charged to Helena to use the High Plain Landfill near Great Falls have been incorporated into the Final EIS.
N-8	It is unknown at this time if the City of Billings would accept waste from Lewis & Clark County or if so at what rate. See response to comment D-12 concerning rail transport. There are numerous possible landfills available if transporting of waste beyond 100 miles is economically justified.
N-9	In fact, liability could increase simply because of the greater distance for waste to be hauled. As noted by the commentor, there might be an accident, and cleanup of the accident might not cost much. However, the commentor does not take into account potential human impact to the truck driver and other motorists. This liability would not be trivial.

Letter and Comment No.	Response
	The suggestion to have special collection days for household hazardous wastes is excellent. DHES agrees that this type of activity provides residents an opportunity to safely dispose of used, spent, or no longer needed household goods which may be hazardous to the environment. In turn, it helps to prevent unauthorized disposal of these types of wastes in the landfill.
N-10	The $13.3 to $21.6 million figure printed on page 4-60 was a typographical error and is incorrect. We apologize for the confusion this error may have caused.
N-11	This is believed to be a typographical mistake. There is no Section 2.2.7 in the Draft EIS, nor should there be. Additional discussion regarding Subtitle D requirements, and the County's plans for compliance, should be referenced to Section 2.2.
N-12	The design calls for the depth of excavation in the waste cells to be a maximum of approximately 41 feet bgs. In areas where ground water is shallower, and the elevation is lower, such as the western portion of the proposed site near the head of the coulee, there would be less excavation. The water levels cited in this comment are the static water levels (SWL) of the wells or the elevation which water rises to in an open well casing. The difference between the SWL and the depth at which the water was encountered when the well was drilled is called the hydrostatic head and is an indication of the amount of confining pressure the water in the aquifer is under at depth. The amount of head (in feet) found with the monitoring wells installed at Site E ranges from 12 feet to 50 feet. To determine an amount of separation of the water disposal area and the ground water one must look at the elevation at which the water was found when the well was drilled. The shallowest water found at Site E was found in the wells drilled in the coulee west of the proposed landfill at a depth of 25 feet. The area where this perched ground water zone was found was excluded in the design of the proposed landfill. The ground water found in the wells within and ringing the proposed 80-acre landfill area range in depth from 69 feet on the western side, further east within the coulee mentioned above, to 159 feet deep on the eastern edge of the proposed disposal area. See Table 3.2-1. Since the average depth of excavation is 20 to 30 feet bgs, the separation between ground water and wastes disposed on the liner system is in excess of 20 feet and is generally much more than that number.

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	The sentence in Section 4.2.1 should have stipulated the "nearest, downgradient private well from Site E". The private well northwest of the site is not believed to be in a downgradient direction from the site. However, the presence of this well has been noted in Section 4.2.1 of the FEIS.
N-13	Please see responses to comments J-14 and P-11.
N-14	DHES believes that the County's proposal does meet minimum standards for landfills and will have to comply with state and federal rules prior to operation. See response to comment N-17.
N-15	Thank you for your comment. See Section 6.5.2.1 of the FEIS.
N-16	Thank you for your comment.
N-17	Private industry has been considered. The CCSS facility is privately owned and operated (Alternative 3), and both the Great Falls and Missoula facilities are privately owned and operated (Alternative 5). See the discussion in Section 2.1.5.3 regarding privatization.
N-18	Thank your for your comment. DHES agrees that this is an excellent suggestion for consideration by the City and County. However, at the present time , the County does not plan to regionalize the proposed landfill. See response to comment J-8.
N-19	DHES contacted the FAA for a written opinion concerning the location of the presently configured Site A alternative and its proximity to the Helena Regional Airport runway (Wilbur 1993a). The FAA response (1993) indicated their objection to siting a landfill within 10,000 feet of the airport runway. The FAA would require additional review if the site was reconfigured to be greater than the 10,000 feet distance, but less than 5 miles "to determine whether the landfill would attract or sustain hazardous bird movements".
N-20	Thank you for your comment. DHES agrees with the commentor that upfront planning and expenditure will help minimize future risk and cost.

Letter and Comment No.	Response
N-21	Thank you for your comment.

Roger Sandiland Letter

O-1	Thank you for your comment.
0-2	Please see the response to comment D-12.
0-3	Thank you for your comment and the examples of rail vs. truck transport. Please see response to comment D-12. .
0-4	Agreed, see Tables 4.12-1 and 5.1-1 for cost estimates for transportation costs for all alternatives.
0-5	Discussion has been added to the appropriate sections on transportation (3.9 and 4.9) regarding funding and road maintenance/upkeep expenses. Whether federal funding for road upkeep is an advantage or disadvantage depends on your perspective. Federal maintenance would reduce costs to the local users. However, persons outside the area of use for the new landfill might object to subsidizing increased wear and tear on the haul roads. DHES disagrees that road maintenance costs should be included in landfill operation cost estimates. It is essentially impossible to quantify the incremental increase cost of roadway maintenance, repair, or construction that would be caused by the traffic generated by use of a landfill.
0-6	Thank you for the information provided. DHES agrees with the conclusion of the comment. The EIS has not evaluated the costs of upgrading York Road or the the suggested impact to the pavement structure of that roadway (See response to comment O-5). DHES does not believe the precise impact of that the level of traffic use projected by operation of the proposed landfill at Site E on York Road can be predicted. DHES agrees that some incremental impact will occur if for any haul route utilized. The increased use of York Road will continue regardless of the landfill operation. Development, including residential, commercial, industrial, and recreational, in this part of the Valley as suggested by numerous commentors will continue with resulting traffic increases and potentially require that sections

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	of York Road to be improved. The mining that occurred at Site E this last year caused more truck use of York Road in a shorter period of time then operation of this landfill is projected to cause over a considerable amount of time.
0-7	The roadway type (two lane vs. four lane) was presented in the analysis of impacts in Sections 3.9 and 4.9 for all alternatives.
0-8	Thank you for the submitted information.
0-9	Please see response to comment J-8.
0-10	Please see the revised discussion and tables in Section 4.12 regarding construction and operation costs for a new landfill, and the contracted cost for Helena to ship waste to Great Falls.

Nancy Greenfield-Schmidt Letter to DHES

P-1	The DEIS and the FEIS explains the state and federal (Subtitle D) requirements for solid waste landfills in Montana and the nation.
P-2	At the date of publication of the DEIS, Subtitle D rules were not yet in effect. The uncertainty of licensing and the possible beginning date of operation of the proposed landfill, compliance with the federal rules potentially might not be required and the language in the DEIS reflected that situation. The Subtitle D rules and the revised state rules are now in effect and will require compliance of the proposed action if licensed. DHES agrees that the purchase price in siting a landfill is not a critical factor in the decision.
P-3	The cost for other communities bringing wastes to the Helena Valley was not considered because the application is only for the landfill to serve the City of Helena, the City of East Helena, and the Scratch Gravel Refuse District. It can be noted that if the volume of waste accepted at the proposed landfill would increase over the projected 40,000 tons a year the operating costs per ton would decrease to some degree.

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P-4	DHES has no information that would suggest the amount used in the costs estimates for Site E for construction of an access road are inaccurate.
P-5	DHES believes the costs estimates presented in Section 4.12 of the DEIS and the FEIS are an accurate reflection of the cost of constructing a landfill at Site E or Site A that would be protective of the environment.
P-6	See response to comment M-8.
P-7	See Figure 3.2-1. Two of the test wells (E-2 and E-4) are within the anticipated boundary of the proposed landfill disposal area. The remainder are on the perimeter. See response to comment F-4. The perimeter wells provide important information regarding the subsurface geology and ground water system. In addition, they can serve as monitoring wells during landfill operation and closure.
P-8	See response to G-30.
P-9	It is unknown why test wells were dug in the fall and not the spring. However, there should be no reason why the time of year is important to well installation.
P-10	Please see response to comment F-2.
P-11	After review of the information in Becraft (1958) and the geological data provided by the drilling logs at Site E it is apparent that the designed excavations for the proposed landfill would not disturb the strata identified as containing elevated radioactive clays. See Section 4.1.1.1 of the FEIS.
P-12	See response to comment G-1. Subtitle D requirements would apply to any new landfill in the State of Montana regardless of acreage.
P-13	It is unclear which information is considered "inadequate" by the commentor, or if all of it is. DHES believes sufficient information is available and presented in the EIS to assess potential environmental impacts and make an informed decision regarding the proposed landfill license. See the general MEPA comment response in Section 6.5.2 of the FEIS.

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P-14	DHES believes the EIS is significantly different than the environmental assessment. New information regarding a number of environmental resources has been evaluated; the consideration of environmental impacts is more detailed; and the range and scope of alternatives has been broadened.
P-15	See response to comment N-11.
P-16	See response to comment N-9.
P-17	There are a number of reasons why an increase in the food source for bald eagles would be of concern, if it is related to a landfill. The most prominent being that it would bring bald eagles into more contact with humans and human activity, increasing the possibility for conflict. Another concern would be for eagles to ingest tainted or contaminated wastes, possibly causing acute distress or resulting in chronic (long-term) problems.
P-18	See response to comment N-7.
P-19	The Draft EIS did contain a comparison of alternatives; see Table 5.1-1.
P-20	Thank you for your comment. Current state public policy encourages waste reduction. The State of Montana Integrated Solid Waste Management Plan was in the process of being developed and written this last year. The final plan will be published early in 1994. Restrictions on licensing landfills by municipalities with or without household hazardous waste collection programs would require modification of the Montana Solid Waste Management Act by the Montana State Legislature.
P-21	Thank you for your comment.

Nancy Greenfield Schmidt Letter to Governor Racicot[1]

Q-1	Thank you for your comment. Site E's proximity to recreational activities has been considered in the EIS, and potential impacts to tourism have been evaluated.

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Q-2	Thank you for your comment.
Q-3	Thank you for your comment.
Q-4	Please see response to comment P-20.

[1] The above responses were prepared by DHES. Also see the response to these comments issued by the Office of the Governor, included at the end of these comment responses.

Montana Environmental Information Center Letter

R-1	DHES disagrees, and believes the both the DEIS and the FEIS meets the requirements set forth in MEPA and DHES' rules implementing MEPA. See response to comment G-53 concerning the request for a supplemental DEIS. See the general MEPA comment response in Section 6.5.2 of the FEIS.
R-2	See response to comment G-1.
R-3	Subtitle D rules were promulgated, but not totally in effect at the time of publication of the DEIS. The assumption proved to be correct.
R-4	The extension of the effective date of October 9, 1993 for the Subtitle D rules and revised state rules was for only certain existing landfill units and would not affect the requirements for any new landfill units considered in the DEIS. The assumption utilized in the cost estimates provided in the DEIS proved to be a correct one.
R-5	Landfill gas management is required only if gas monitoring of the site identifies a safety problem with build-up of methane gas. Management of such a problem has a very broad spectrum of remedies which are dependent on the site characteristics and the extent of the problem. It would be unreasonable to attempt to budget such undefinable costs at this time and the problem could potentially be the same at all alternatives considered. Leachate management costs are not included due to the lack of evidence of costs of significant leachate production at landfills in Montana at this time. Again the operation cost of management of this

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	effluent would potentially be similar between alternatives. The operational cost estimate range is purposely large due to these unquantified potential costs. A check of the references utilized in development of the cost estimates in Section 4.12 would provide information on the individual items included in the estimate. For an itemization of the County's estimated cost analysis and budget of the proposed action, see Damschen 1993 in Appendix B.
R-6	DHES agrees that a change in the amount of waste disposed of per year would extend or shorten the active life of the landfills considered, depending on whether it increased or decreased. This affect would be equal for all alternatives and for the purpose of comparison in this review, the annual amount was projected at 40,000 tons and each site has a finite capacity to work within.
R-7	See the response to comment D-12.
R-8	Agreed, see Tables 4.12-1 and 5.1-1 of the FEIS for analysis of transportation cost estimates for each alternative.
R-9	See Section 3.9 and 4.9 of the FEIS and responses to comments O-5 and O-6.
R-10	No ground water divide has been identified at Site E; ground water flow at the site has been characterized to move in a broad sweep from the southwest to the east from a recharge area to the northwest of the proposed landfill area. It is agreed that Site E is located on a topographical surface water divide. Comparisons with the other alternative were provided in the DEIS in Section 4.2 and 4.3 for ground water and surface water impacts. It is agreed that ground water flows are less complex at Site A and CCSS landfill, however, both sites are located adjacent to significant surface water drainages and estentially the CCSS landfill is in as close proximity to Prickly Pear Creek as any surface water resource near Site E.
R-11	See responses to comments F-2 and H-2.
R-12	See response to comment N-12.
R-13	Please see response to comment F-2. None of the data collected for Site E suggests the presence of near-surface ground water which in turn recharges springs

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	east of the property, and Cedar Creek. However, there may be a connection between irrigation canals and rainfall events, and the flow of water at the subject springs. As the response to comment F-2 also illustrates, there is insufficient evidence to dismiss or confirm a connection between the ground water system at Site E (where ground water levels are known from a number of wells) and the springs feeding Cedar Creek.
R-14	Those rules are now in effect for any new landfill or existing landfills accepting more than 100 ton per day.
R-15	Thank you for your comment.
Jerry Arbini Letter	
S-1	Agreed that CCSS Landfill is currently licensed by DHES as a Class II landfill, however, the current annual tonnage of waste accepted at this facility is approximately 6,000 tons. For this facility to accept an additional 40,000 tons of waste would constitute a 800% increase in the CCSS landfill's current activity or operation and, therefore, would be viewed as a significant modification of the existing license and would require a modification of that license. Additionally with the requirements under Subtitle D and the revised state rules, the existing design and plan of operation of CCSS Landfill will be required to be modified in the near future. The option to request permission to utilize approved alternative daily cover and in turn potentially increase capacity is available under Montana Administrative Rules for all licensed landfills.
S-2	CCSS is not different, and would be subject to the same deadlines as Site E, with the exception of provisions in Subtitle D or state rules regarding existing disposal units vs. new units. It was assumed during development of the EIS that if it was selected as the preferred alternative, CCSS would not be able to present an application for landfill modification, have it approved, and begin construction prior to the statutory deadline.
S-3	Thank you for the comment, and we apologize for the misspelling. Hopefully, all references have been corrected to "Ben Sale."

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S-4	DHES disagrees that composting in colder regions has not been a successful endeavor. Yard wastes composting in Montana has been very successful for those programs that have been attempted, such as the composting that is done at the City of Bozeman landfill. This yard waste program was profiled in the SWANA (1992) national newsletter in an article entitled "Having A Successful Municipal Compost Program; City of Bozeman, Montana". This composting program reports approximately 4% of total wastes by weight being composted. The numbers in the comment itself (1 to 19% by weight) suggested that the 2,000 to 4,000 estimate of compostable materials in the DEIS are achievable.
S-5	Proposals for separate collection of compostable yard waste have been made to the City of Helena. DHES is unaware of any commitment by the City or the County to this type of effort at this time.
S-6	Agreed. A modification to the text has been made which recognizes other alternatives than the development of a new facility.
S-7	DHES does not agree that an in-depth discussion of the environmental problems associated with the Helena and Scratch Gravel facilities is relevant to this study. The justification for an action has been made clear, that there is little or no long term capacity remaining at either facility.
S-8	As stated in the DEIS the population figure of 35,000 for the proposed service area was an estimate made by the proponent in the 1990 application. The 1990 U.S. census cited on page 3-68 of DEIS indicated a population for the Cities of Helena and East Helena and southern Lewis & Clark County of approximately 45,000. According to DHES files the reported 1992 tonnage of waste accepted by the Scratch Gravel landfill was approximately 15,000 tons, the City of Helena landfill reported accepting almost 30,000 tons. The reported total of 45,000 may not be precise since Scratch Gravel does not weigh incoming waste like the City landfill. CCSS landfill 1992 reported tonnage was approximately 6,000 tons with service provided to customers in Jefferson County, also. It is difficult to reconcile the statistics used in this comment and the current amount of waste being disposed of at existing facilties with the suggestion that "...less than 20,000 tons per year should be figured." It is apparent that efforts in waste reduction, recycling, and composting would have significant potential to succeed in this area and given the

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	projected growth in population in this area over the next decade and into the next century (see table 3.12-1), conservative estimates of waste volumes seem appropriate.
S-9	It is agreed that recycling involves costs for collection, processing, and transport. However, the avoided costs of collecting these materials as wastes, transport, disposal, and the savings of valuable landfill capacity and the savings to society by avoidance of the need for additional virgin raw materials would seem to out weigh the costs of recycling. Also, it is both state and federal public policy to encourage recycling in preference to landfilling of waste. Markets for recyclables in the Helena area, the last few years, have been rather stable except for green glass. If materials can be recycled, than consideration of the decision whether recycling should occur based on all factors including but not limited to economics. Should a recycling option not be available by lack of markets or any other reason, then recycling of that portion of the waste stream should not be logically considered.
S-10	Opinions differ in design features of leachate collection and removal systems. It is agreed that some of the areas of concern over use of manholes must be addressed by the proponent. For example, manholes at landfill would be considered "confined spaces" and appropriate health and safety plans would be required to access them by personnel under federal Occupational Health and Safety Administration (OSHA) rules and any penetrations of the final cover by the structures must be carefully designed and constructed. However, alternative designs that provide leachate storage such as sumps or open leachate storage ponds have limitations and areas of concern to those designs also (i.e. liner penetrations or bird and animal hazards).
S-11	A passive methane venting system will be necessary with the capping of the disposal areas utilizing a composite final cover. Methane controls (passive or active) during the active life of landills are not required at this time unless a safety problem is detected during required quarterly methane monitoring. See Section 4.12 concerning potential future regulations requiring active landfill gases management under the Clean Air Act.

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S-12	Thank you for your comment. According to the County's response to this comment (Board of County Commissioners 1993) it is now projected that staffing of the proposed landfill would include a minimum of two full time employees. The appropriate section in the FEIS has been changed.
S-13	The phase quoted from page 2-29 of the DEIS is not clear as to what the County has committed to during the license review process. Once waste is deposited in the disposal area compaction and application of cover will begin with 15 minutes and the required six inches of soil for daily cover will be applied within 60 minutes. The statement in Section 2.2.3 concerning this issue has been clarified in the FEIS. It is agreed that this is an unconventional mode of operation, but planned due to the potential impact to birds of the area if the wastes were left uncovered throughout the day.
S-14	See response to comment S-10.
S-15	Yes, according to the license application and recent communication from the Applicant (Board of County Commissioners 1993) all wastes hauled by the public would first go to the City of Helena Transfer Station.
S-16	Agreed, both state and federal rules require the erosion layer of the final cover to provide protection of the infiltration layer from damage by freeze/thaw effects and rooting damage. The stated minimum required depth of six inches for the erosion layer may be insufficient to provide the protection necessary and compliance with the rules. However, a synthetic geomembrane component of the final cover has different resistance to freeze/thaw damage than compacted soil layers.
S-17	The design of the City of Helena transfer station includes potential storage of projected volumes of waste for approximately three days in winter and two days in spring, summer, and fall (MDHES 1992).
S-18	See response to comment S-1.

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S-19	The Temporary , Interim ("Emergency") Zoning Regulations For Northeastern Jefferson County passed by the Jefferson County Board of Commissioners in Resolution number 2-92 and extended under Resolution number 7-93 states: "No such nonconforming use shall be increased or expanded beyond its level of business activity, business operation, vehicle traffic, and/or annual surface disturbance, existing as of the adoption of these regulations." The DHES interprets this statement to preclude the City-County Sanitation Landfill from expanding the "activity" or "operation" of the facility beyond current levels as would be necessary to incorporate the wastes generated by the City of Helena and the Scratch Gravel Landfill District. The inclusion of the waste from the study area would constitute a 800% increase in the CCSS landfill's current activity or operation and, therefore, not be allowed under the current emergency zoning regulation of Jefferson County.
S-20	Thank you for the information regarding the sampling program at the CCSS facility.
S-21	Since there is no plan of operation for a composting facility available at this time, this information is not available for this analysis. Options include separate collection of yard waste in the City of Helena (see response to S-5) and/or separate collection of yard waste at the City transfer station.
S-22	See response to comment S-21.
S-23	Agreed, a reduction of annual tonnage would impact per ton operational costs.
S-24	DHES disagrees with this comment. See response to comment S-4.
S-25	According to the County the roads to Site E have not ever been closed (Board of County Commissioners 1993). Concerning storage capability see response to comment S-17.
S-26	There are no related developments regarding mini-transfer stations, hence, no mention of alternate proposals for such items. The decision and implementation of the planned City of Helena transfer station for collection and transport of waste

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	from the designated service area predates the DEIS and is not under consideration in this process.
S-27	See response to comment S-26.
S-28	Thank you for the comment. Indeed, a curbside recycling program is in place in Helena. The Helena waste transfer station also has a drop-off center for source separated recyclable materials; it is anticipated this will serve residents from unincorporated portions of the County, without access to a curbside program.. These two programs should be complementary. It is doubtful that a new Material Recovery Facility at the CCSS facility would be logical or cost-effective, given the expense which has gone into the Helena transfer station.
S-29	See responses to comments S-17 and S-25.
S-30	The soil budget analysis from the original application for the proposed landfill at Site E (Damschen 1990a) indicated a surplus of available soils for the proposed landfill, even with a projected three foot thick final cover. The modified composite liner proposed for the landfill calls for utilizing premanufactured geosysnthetic soil liner (GCL) in place of the soil liner component. In consideration of these factor it is apparent that sufficient quantities of soils are available on site, after the mining of clay under the DSL permit.
S-31	Thank you for this information. No data has been received by DHES verifying these conclusions.
S-32	Thank you for the information and comparison. Please see Section 3.2.2.3 of the FEIS for data collected during recent hydrogeologic investigations at this site (Gallagher 1993) that found ground water at shallower depths than cited in this comment.
S-33	Should the assumptions/conclusions presented in comments S-31 and S-31 be correct, the CCSS facility may indeed have a similar capacity as Site E for inhibiting downward migration of leachate. However, as noted above (response to comment S-32), DHES has either no data verifying these conclusions or different data then presented by commentor. Agreed that private wells are in

Letter and Comment No.	Response
	much closer proximity to Site E than the CCSS site, and no residential wells are believed to be immediately downgradient from the CCSS site (Table 5.1).
S-34	Agreed that visual impacts at the CCSS facility would be less than at Site E (see Table 5.1-1).
S-35	The waste volumes currently disposed of at the CCSS Landfill (approximately 6,000 tons) were not factored in the projected volumes of waste for the proposed action. DHES does not believe that 20,000 tons is a realistic tonnage for consideration for the proposed action. See response to S-8.
S-36	A leachate collection system has been considered in the cost analysis presented in Tables 4.12-1 and 4.12-2 in both the DEIS and the FEIS. Gas management at closure and during post-closure were included in the cost estimates for those activities. Gas management systems (passive or active) are not required during operation at this time unless a safety issue is discovered during required monitoring.
S-37	Transfer station costs are not included in this analysis since they are not a factor in the location of any disposal option considered in the EIS. Both the City of Helena and the County have committed to utilization of the existing transfer station for collection of waste for transport to the selected disposal location. Transportation costs were included in the analysis of alternatives because alternative location impacts this aspect of the collection process.
S-38	Thank you for the information. However, DHES has not received official communication from representatives of Ben Sale, or Lewis & Clark County, affirming this offer. The most recent price offered to the City (Sale 1992), of which we are aware, is about $37 per ton. This is the price used in our cost analyses in Section 4.12.3 and appropriate tables.
S-39	Cost estimates were develop as described in the response to comment G-12.
S-40	Only three additional or future wells are anticipated. There are already a number of wells at Site E which would be available for monitoring purposes.

Letter and Comment No.	Response
S-41	Thank you for the comment. Agreed; we have attempted to modify the text to reflect a facility "upgrade" (to meet Subtitle D requirements), "expansion", in this instance implies additional areas of disturbance within the licensed 60 acres.
S-42	Please see response to comment S-38.
S-43	See response to comment S-19.
S-44	A complete engineering plan and revised operation and maintenance plan for the CCSS facility upgrade has not been received by DHES.
S-45	Thank you for your comment. DHES believes it is a concern worth considering.
S-46	As mentioned in Section 2.1.5.4 of the DEIS and the FEIS "recycling and composting are not evaluated as a separate alternative in Chapter 4.0 because they are processes equally applicable to any of the alternative landfill sites, and are not directly relevant to the central issue of this EIS, which concerns the location of a new landfill". The incorporation of a large composting operation (10,000 cubic yards per year or co-composting of wastes) into a new landfill design can be jointly reviewed and licensed with the landfill operations. However, the incorporation of a large composting operation into an existing licensed landfill would require a separate environmental review and approval. Therefore, the inclusion of composting by contractual means could be problematic if prior review and approval from the DHES have not been obtained.
S-47	DHES does not consider long term use of the existing City of Helena and Scratch Gravel Landfills as a viable option for consideration and analysis.
S-48	The DHES disagrees with this comment. Alternative 4, Modification of the Proposed Action, was properly selected and considered by the DHES as a possible alternative to the proposed action of landfilling all wastes at Site E.
S-49	Numerous issues related to the proposed use of the existing CCSS Landfill have been raised during the MEPA review process such as zoning restrictions and license modifications. DHES believes that this alternative has adequately been presented and the potential impacts described.

Letter and Comment No.	Response
S-50	See Response to comment G-40.
S-51	See response to comment S-44. The past performance of operators of landfills in Montana is not within DHES' authority for review in licensing actions and the MEPA review of those actions. DHES can only assume that commitments made by applicants will be honored and that compliance with the laws and rules of the state will be maintained. Failure to honor commitments or comply with the law and rules will result in enforcement action by DHES under the authority of appropriate statutes.
S-52	Thank you for your comment. This is consistent with the DHES's comment on page 5-6 of the Draft EIS that no one alternative site is significantly superior to the others.

Public Hearing Transcript[2]

[2] Note: Many of the comments contained in the transcript of oral testimony, presented at the Draft EIS hearing on May 17, are duplicative of comments contained in the letters responded to above. Therefore, a majority of comments from the following transcript are referred to earlier comment responses.

Statement of Mr. Richard Nisbet

T-1 Thank you for your comment.

Statement of Mr. Thomas Morrison

T-2 Thank you for your comment.

T-3 See response to comment M-2 and G-14.

T-4 The EIS is concerned with the cost analyses and cost requirements for a new landfill. For this reason, independent cost estimates have been developed by DHES' consultant (see Section 4.12). These have been updated and revised based on the information submitted to DHES by the proponent, since publication of the Draft EIS. DHES does not believe the proponent's history with respect to economic forecasting and planning is relevant.

Letter and Comment No.	Response
T-5	Please see responses to comments G-14, H-6, H-7, and R-5 and Section 4.12 of the FEIS.
T-6	See responses to comments M-8, and M-10.
T-7	See response to comment M-8.
T-8	Lewis & Clark County and the City of Helena have been operating landfills for a number of years. While there is a significant amount of environmental impact associated with the Scratch Gravel and Helena Landfills, it is likely that the primary factor contributing to contaminant releases is the poor engineering of those facilities. As we know, landfills were not constructed in years past to provide the degree of protection, especially to ground water resources, that we require today. The operation of a new, properly designed facility should not be difficult, or beyond the expertise and means of the County's resources. However, it is not reasonable to believe that the County or City of Helena have in-house engineering experience comparable to private companies that specialize in civil engineering, and landfill construction and operation. For this reason, Lewis & Clark County and City of Helena rely on contracting the services of consulting engineers and geologists for special expertise. Regarding accountability, in the event of environmental problems associated with a landfill. Citizen's suits, authorized by Section 7002 of the Resource Conservation and Recovery Act of 1976 (the law which contains Subtitle D for state and regional solid waste disposal planning), allow for any person to commence a civil action against any person (including the United States and any other governmental instrumentality or agency) who has contributed or is contributing to the past or present handling, storage, treatment, transportation, or disposal of any solid waste which may present an imminent and substantial endangerment to health or the environment. In other words, the county of Lewis and Clark, City of Helena, and governing officials should be just as accountable as a private firm and their representative agents.
T-9	See responses to comments M-3 and M-4.
T-10	Thank you for your comment.

Letter and Comment No.	Response
T-11	See response to numerous comments regarding operating costs, particularly comment N-7.
T-12	This is incorrect. The $6.2 million to $9 million estimate in the DEIS was for capital costs, but not all capital costs would occur at the same time as the entire facility would not be constructed at once. It is anticipated that one, or two at the most, cells (out of 12) would be constructed initially. See responses to comments M-3 and M-4.
T-13	See the response to comment I-2. There would be virtually no capital cost to ratepayers associated with use of the CCSS landfill because the private owner would bear the initial costs for site upgrade, Subtitle D compliance, etc. The owner would then have to redeem these costs through tipping fees.
Statement of Ms. Terri Claassen	
T-14	See responses to comments F-1 and K-1.
T-15	See responses to comments G-7, K-2, and R-4.
T-16	See responses to comments G-7, G-51 and K-2.
T-17	See response to comment K-3.
T-18	Thank you for your comment. See response to comment K-4.
Statement of Mr. Jeff Claassen	
T-19	See responses to comments G-7 and K-2.
T-20	The commentor requests that "value" be attached to the level of risk at each site, noting the "high risk of potential ground water contamination." DHES disagrees with this premise. The risk of ground water contamination at any of the three sites (E, A, and CCSS) should be low due to the construction requirements imposed by Subtitle D and similar state rules. Many substandard landfills do leak; however, this landfill will be constructed using state-of-the-art technology. This

Letter and Comment No.	**Response**
	technology does not eliminate the potential for ground water contamination, but it does greatly reduce the likelihood of such an occurrence.
T-21	See response to comment J-2.
T-22	See response to comment T-4.
T-23	See response to comment J-7.
T-24	Costs analyses in Sections 4.9 and 4.12 have been revised to include the contracted disposal costs for Helena to ship waste to the Great Falls landfill, and to assess the additional costs associated with transport to Site E, relative to Site A or the CCSS facility.
T-25	See response to comment J-8.
T-26	See response to comment J-16. A windrose was included in the Draft EIS, see Figure 3.4-1. This windrose was based on data collected at the meteorological station at Helena airport, the closest location to Site E with the amount and quality of data necessary to assess air patterns.
T-27	See response to comment J-12.
T-28	See responses to comments J-10 and J-11.
Statement of Ms. Mona Jamison	
T-29	Thank you for the comment.
T-30	See response to comment G-1.
T-31	See response to comment G-2.
T-32	See responses to comments G-3 and G-4.
T-33	See responses to comments G-3, G-4, and G-6.

Letter and Comment No.	**Response**
T-34	As noted in earlier comment responses, the cost analyses in Section 4.12 have been revised. See response to comment G-1.
T-35	See response to comment G-4.
T-36	See response to comment G-5.
T-37	See response to comment G-5.
T-38	Thank you for your comment.
T-39	See responses to comments G-8 and G-53.
T-40	See response to comment G-10.
T-41	See responses to comments G-12 and M-2.
T-42	Thank you for your comment.
T-43	The County Board of Commissioners supplied DHES with a table providing a breakdown of costs associated with Site E, beginning in 1993 and through fiscal year 2000 (Board of County Commissioners 1993). These estimates were apparently distributed to the Board of County Commissioners at the May 1993 meeting. A more indepth cost analysis and budget for the proposed landfill was presented to the District Board at their July, 1993 meeting. Using an estimated tonnage of 40,000 tons per year, the tipping fee was projected to be $22.50 per ton initially.
T-44	DHES is confident the alternatives represent a reasonable range of options. See response to comment G-30.
T-45	See response to comment G-30.
T-46	See response to comment G-32.

Letter and Comment No.	Response
T-47	See response to comment N-7 regarding the discrepancy between Draft EIS estimates to transport waste to Great Falls or Missoula, versus the actual contracted rate obtained by Helena this year. The contracted rate to ship waste to Great Falls is about $27.00 per ton. This rate will be subject to an annual upward modification based on the Consumer Price Index, and possible increases due to property and fuel tax increase or cost of regulatory compliance. In other words, the disposal cost will increase each year. This rate is currently comparable to the high-end estimate provided in the EIS. However, the cost to dispose in Great Falls would exceed local disposal costs within a few years due to the annual adjustments. For comparison, the current disposal cost estimated by the County for Site E is $22.50 per ton, which is significantly less than the cost to ship waste to Great Falls.
T-48	See response to comment T-39.
T-49	See responses to comments G-36 and G-51. The submittal mentioned in the comment, *Preliminary Design Outline for the Ben Sale Landfill* was received by DHES in May, 1993 (Blue Ridge Services). It contained a conceptual outline of modifications to the design and operational plans of the CCSS Landfill. DHES response was a letter sent in August, 1993 requesting clarification of some points and more design and specifications to the proposed modifications. Neither the owner or the operator of this facility has yet responded to this request.
T-50	See response to comment G-49.
T-51	See response to comment G-49.
T-52	See response to comment G-49.
T-53	Thank you for your comment.
T-54	Thank you for your comment.
T-55	Thank you for your comment.
T-56	Thank you for your comment.

Letter and Comment No.	**Response**
T-57	We are unclear how the commentor derived the "additional" cost of $30,000 to transport waste to Great Falls due to lack of a local disposal facility. Using Helena's contracted rates ($27.00 per ton) vs. the $22.50 per ton estimated by the County for waste disposal at Site E, the city of Helena would have to dispose approximately 7,000 tons in a month to achieve the suggested additional cost to ratepayers. However, the city of Helena currently disposes approximately 2,000 tons per month. The cost to taxpayers would be approximately $9,000 per month.
T-58	Thank you for your comment.
T-59	Thank you for your comment and information regarding the advantages of rail transport. Please see response to comment D-12.
T-60	Please see response to comment O-4.
T-61	Please see responses to comments O-5 and O-6.
T-62	Please see response to comment O-6.
T-63	Please see response to comment O-7.
T-64	Please see response to comment O-8.
T-65	Please see response to comment J-8.
T-66	Please see response to comment O-10.
T-67	Please see response to previous comments regarding costs for the various alternatives. Section 4.12 has been revised to incorporate new information regarding costs, and to better describe the budgeting elements of construction, and operation and maintenance, associated with a new landfill.
T-68	Thank you for your comment.
T-69	As discussed in Section 5.5 of the DEIS and the FEIS, the DHES' analysis did not find any one site to be environmentally superior to other sites.

Letter and Comment No.	Response
T-70	See response to comment I-1.
T-71	See response to previous comments regarding costs for the various alternatives. In particular, please see responses to comments I-2 and T-13.
T-72	See responses to comments B-1 and B-2.
T-73	Elevations were surveyed.
T-74	"Sole Source" is a special designation for an aquifer which provides for additional governmental review and protection against detrimental impact. However, the Helena Valley Aquifer has not been designated Sole Source.
T-75	Please see responses to earlier comments regarding ground water in the vicinity of Site E, and the potential for contamination of water resources, particularly comments D-6, F-2, and H-3.
T-76	See responses to comments F-2 and H-2.
T-77	See responses to comments B-3 and B-5. Baseline water quality sampling is not required prior to licensing of a landfill. Applicants usually defer this costly procedure until a license is issued for the proposed landfill. The ground water monitoring plan quoted in the comment was proposed in 1990 by the proponent. This plan would not comply with current state rules for ground water monitoring (see Section 2.2 of the FEIS) which required on site monitoring of wells constructed for solely monitoring purposes. It is anticipated that if a license is issued, that the County will submit to DHES for approval a ground water monitoring system that incorporated the existing monitoring wells on site and possibly additional monitoring wells.
T-78	All the compounds referred to (from page 2-30 of the Draft EIS) were not analyzed for during baseline investigations into Site E. This is because the list of compounds was established in Subtitle D, which was published subsequent to much of the field work for the Site E application. See responses to comments B-3, B-5, and T-77. Baseline water quality will have to be established prior to waste acceptance.

Letter and Comment No.	Response
T-79	Please see responses to earlier comments. DHES believes the Site E subsurface and ground water system has been sufficiently characterized for environmental impact analysis, and for licensing purposes.
T-80	Please see response to comment P-14.
T-81	Please see responses to earlier comments concerning Cedar Creek, and ground water and surface water flow, in particular comments F-2 and H-2.
T-82	Please see response to comment H-2.
T-83	Please see responses to comments H-2 and H-4.
T-84	Please see responses to comments H-2 and H-3.
T-85	Please see response to comment H-3.
T-86	Please see response to comment H-4.
T-87	Please see responses to comments H-5, H-6, and H-7.
T-88	Please see response to comment H-7.
T-89	Please see responses to comments H-6 and H-7.
T-90	Thank you for the historical information concerning Sites E and A.
T-91	Additional analysis has been incorporated into Section 4.9 to evaluate the impact of transport mileage (and other transportation factors, such as stoplights, train crossings, etc.) on long-term costs. Also, please see responses to comments D-3, O-5, and O-6.
T-92	Please see response to comment D-11. There have been tests of subsurface water on Site E. Two of the wells are located within the planned disturbance area. A number of other wells are on the immediate perimeter of the planned disturbance

Letter and Comment No.	Response
	area; these wells provide important information on the subsurface geology and ground water as well.
T-93	Please see response to comment D-5.
T-94	Please see response to comment M-8 regarding development potential. FAA has considered Sites A and E, and has expressed distinct concern with Site A's proximity to the Helena Airport runways due to the increased potential for aircraft/bird collision. FAA has indicated no concern with Site E (FAA 1993). Please see response to comment N-19.
T-95	Please see responses to comments D-1, D-2, D-3, and G-31.
T-96	Please see response to comment D-11.
T-97	Please see response to comment D-3.
T-98	Thank you for the additional information.
T-99	Please see response to comment D-1.
T-100	Please see response to earlier comments. See response to comment D-11.
T-101	DHES is not aware of any plans for a road from the regulating reservoir north to Site E. The proposed transportation route is shown on Figure 3.9-1. This route should accommodate winter transport.
T-102	Thank you for the information. See response to previous comment.
T-103	Please see response to comment D-12.
T-104	Please see response to comment G-30.
T-105	Please see responses to comments N-19 and T-94, and FAA communication to DHES on July 22, 1993 (FAA 1993).

Letter and Comment No.	Response
T-106	See response to D-1.
T-107	DHES is unaware of any discussions between the parties mentioned. See response to comment J-8.
T-108	See response to D-12.
T-109	See revised Tables 4.12-1 and 5.1-1 in the FEIS.
T-110	Thank you for your comment. See response to comment D-2.
T-111	Thank you for your comment.
T-112	Please see responses to comments G-7 and R-4.
T-113	The period for review of, and comment to, the DEIS was extended.
T-114	Please see responses to comments G-8 and G-53.
T-115	Thank you for your comment.
T-116	Thank you for your comment.
T-117	Thank you for the historical perspective.
T-118	Thank you for your comment.
T-119	Thank you for your comment. See Section 4.12 regarding cost analyses for waste shipment to Great Falls vs. disposal at Site E or other alternative sites.
T-120	Thank you for your comment.
T-121	Thank you for your comment. DHES recognizes the concern expressed by you and many of your neighbors regarding the potential for harm to environmental resources from a landfill at Site E. We believe the EIS has adequately discussd these issues and impacts.

Letter and Comment No.	Response
T-122	Please see response to comment D-6, and the discussion of the proposed landfill design in Section 2.2.1.
T-123	Thank you for the analogy.
T-124	Please see response to comment H-3. A history of costs to repair landfills would probably not be valid for use in predicting "failure" costs at Site E. This is because most solid waste landfills constructed prior to the mid-1980's did not employ a liner or leachate collection system. However, as recognized in response to comment H-3, ground water cleanups can cost millions of dollars, with years and even decades required to achieve an appropriate level of cleanup. Hence, it is very practical and cost-effective to make use of state-of-the-art technology in landfill design and construction.
T-125	"Gourmet" prices aren't defined, but it is clear that the use of best available technology to protect resources also requires a commitment of funds much greater than an amount needed to provide minimal resource protection.
T-126	Thank you for the comment.
T-127	Please see revised cost analyses in Section 4.12.
T-128	Thank you for the comment, which indicates that Jefferson County may recognize a future need or desire to rescind the ordinance.
T-129	See response to previous comment. As other municipalities also anticipate a shortage of landfill space in the near future, many within and in the area of Lewis & Clark County likely consider the Ben Sale facility, and a future landfill at Site E or A, to be serious waste disposal options. Please see response to comment J-8.
T-130	DHES agrees that, all other factors being equal, it would be desirable to have only one waste disposal facility in the area. See response to comment G-40. Thank you for the additional information regarding Mr. Sale's proposals to the community, and for his perspective on the decision-making process.

Letter and Comment No.	Response
T-131	Thank you for the comment. The sign-up sheet did not state what the FOR-AGAINST columns represented, if anything. DHES' apologizes for the misunderstanding.
T-132	Thank you. There were, indeed, no negative or positive implications drawn from personal "preferences" marked in the columns mentioned in the previous comment.
U-1	Thank you for the comment.

OFFICE OF THE GOVERNOR
STATE OF MONTANA

MARC RACICOT
GOVERNOR

STATE CAPITOL
HELENA, MONTANA 59620-0801

June 21, 1993

Ms. Nancy Greenfield Schmidt
415 Ford
Missoula, MT 59801

Subject: Lewis & Clark County Site E Landfill Environmental Impact Statement.

Dear Ms. Schmidt:

Thank you for your letter concerning the Draft Environmental Impact Statement (EIS) for the proposed Lewis & Clark County Site E Landfill. I am very sorry that you found the Draft EIS inadequate. However, please keep in mind that this is a draft and will undergo revisions prior to becoming a Final EIS. The Department of Health and Environmental Sciences staff are currently reviewing the comments received on the Draft EIS, including your own, and are affecting changes as necessary. Also the Lewis & Clark County Commissioners are doing the same and are supplying the Department with additional information as needed to improve the EIS.

This EIS for the Lewis & Clark Site E Landfill is a first for the State. Never before has an EIS been prepared for a landfill license approval. Needless to say, it has been a learning experience for everyone. We clearly understand that most people do not want a landfill, no matter how good it may be, for a neighbor. Unfortunately, today's societal habits and technology make landfills necessary for the disposal of our wastes. Hopefully, the future will bring us new, more environmentally sound, and economical ways to handle our wastes.

The problem of household hazardous waste disposal has been considered by many state and local government entities. The main difficulty of these types of programs are their costs. Ultimately, the household hazardous wastes that cannot be reused or recycled must be disposed of. Since Montana does not have a hazardous waste disposal area within the state, it must be shipped off to some other area for disposal at substantial expense. Many local governments find it extremely difficult to come up with the revenues needed for this and many generators of the wastes (households) are unwilling to pay the costs. However, the Department of Health & Environmental Sciences in conjunction with the Montana State University Extension Service has prepared a

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household hazardous waste education program for the State. This program has been in effect for the past year and centers around the education of our children through the school system about the hazards and alternatives to household hazardous waste use and disposal. Since our children are our future and our leaders of tomorrow, this program will hopefully begin the solution to this problem.

The Department of Health & Environmental Sciences is also nearly finished with the development of the Montana Solid Waste Management Plan. Once published the plan will be available to those who wish to use it for suggestions and ideas about solid waste management topics including recycling, reuse, disposal, and household hazardous wastes. It is anticipated that the draft plan will be published for public comment later this summer.

Once again I would like to thank you for your comments and assure you that the State of Montana will do what we legally can to make sure that any disposal site complies with Montana's laws and rules and is as safe as possible.

Sincerely,

Marc Racicot

Marc Racicot
Governor

cc: Bob Robinson, Director DHES

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7.0
LIST OF EIS PREPARERS

CHAPTER 7.0
LIST OF PREPARERS

The individuals listed in Table 7.1-1 were instrumental in preparing the EIS for the proposed Lewis & Clark County Landfill. A number of agencies, groups, and individuals were contacted during development of the EIS. These include various departments of the Montana State government, officials from Lewis & Clark and Jefferson counties, individuals and organizations that have prepared background information for the study area evaluated in this EIS, firms associated with planning projects for the government entities, and some persons who have expressed an interest in the State's decision-making process. Chapter 8.0, References, lists all of the parties contacted or sources consulted for EIS development, if the information transmitted was used in the EIS.

TABLE 7.1-1

LIST OF PREPARERS

NAME	ORGANIZATION	RESPONSIBILITY	QUALIFICATIONS
Jon Dilliard	DHES/SWMP	Program Manager	BS, Biological Sciences
James Wilbur	DHES/SWMP	Permit Coordinator	MS, Earth Sciences BA, Political Sciences
Mark Stahly	DHES/SWMP	Program Attorney	JD, (Montana)
Patrick Crowley	DHES/SWMP	Regulatory Lead	BA, Zoology and Geology
Patricia Potts	DHES/SWMP	Hydrogeologist	BS, Geology
Ken Wallace	Woodward-Clyde	Project Manager	MS, Geology BS, Geology
Laurie Batchelder Adams	Woodward-Clyde	Assistant Project Manager & Landfill Engineering	MS, Civil Engineering MS, Environmental Policy & Management (pending) BS, Medical Technology
Richard Bell	Woodward-Clyde	Project Director	Graduate studies, soil science BA, Distributed Science Major
Scott Benson	Woodward-Clyde	Wildlife & Vegetation	BS, Wildlife Biology MS, Environmental Engineering
Linda Craigg	Woodward-Clyde	Geology, Soils, & Surface Water	BS, Geology
Andre' Fiedler	Woodward-Clyde	Groundwater	MS, Earth Sciences BS, Geology & Geophysics
Chris Freeman	Woodward-Clyde	Transportation & Socioeconomics	BS, Environmental Planning Analysis
David Jones	Woodward-Clyde	Land Use, Recreation & Visual Resources	MS, Natural Resource Planning BS, Landscape Horticulture BS, Agriculture
Bill Killam	Woodward-Clyde	Cultural Resources	BA, Anthropology, Sociology & Psychology
Scott Mernitz	Woodward-Clyde	Transportation & Socioeconomics	PhD, Land Resources MA, Geography BA, Geography
Marty Smith	Woodward-Clyde	Air Quality & Noise	BS, Environmental Sciences (pending)

DHES/SWMP = Department of Health & Environmental Sciences, Solid Waste Management Program
Woodward-Clyde = Woodward-Clyde Consultants, the 3rd party consultant to DHES for EIS preparation

8.0
REFERENCES

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REFERENCES

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APPENDIX A
PUBLIC COMMENTS FROM SCOPING PROCESS

APPENDIX A
PUBLIC COMMENTS FROM SCOPING PROCESS

TABLE A-1

PUBLIC COMMENTS

	Comment	Section(s) Where Addressed in Text
LAND USE		
General		
1.	Concerns about what will happen to the landfill after capacity.	4.10.1, 4.10.2, 4.10.3
2.	Proximity to residential areas not given enough weight in siting process.	3.10.1, 3.10.2, 3.10.3
3.	Many multi-generational landowners affected.	Cultural significance assessed in 4.8
Site A		
1.	Potential for development in the following areas: Lowrey's road, Beltview interchange, Sleeping Giant, and Northern Jefferson County.	3.10.2, 4.10.2
Area C		
1.	Landfill activity would severely affect agricultural operations.	Not relevant[1]
2.	Site C is a possible development area.	2.1.5
3.	Area C is cultivated land and would last for approximately 70 years.	Not relevant[1]
Site E		
1.	Site E is very close to a subdivision.	3.10.1, 4.10.1
2.	What about the remaining part of the acreage not used for the landfill?	4.10.1
3.	Concerns about the effects on adjacent land uses and value (present and future).	4.12.1
4.	Why put a landfill on uncontaminated land?	2.1.5.2, 2.4
5.	Site E was picked because it was the land that the purchasers got for the best price, not because of its environmental suitability.	2.1.3.2
6.	Site E was located on top of a hill with a double water divide: - flows east to Hauser Lake - flows west/northwest to Lake Helena - flows southeast to Cedar Creek drainage - Helena Holding Reservoir (?) south	3.2.2.1, 3.3.2
	There are also high voltage power lines and a natural gas pipeline in the area.	3.10.1, 4.10.1
Area G		
1.	Concerns about Scratchgravel site and neighborhood.	Not relevant[1]

TABLE A-1
(Continued)

Comment	Section(s) Where Addressed in Text
Area H	
1. Rent, lease, and buy situations would be determined in part by specific locations and land use.	Not relevant[1]
2. Liability under rent or lease options: farmland may have advantage for leasing and grazing land may have advantage for buying.	Not relevant[1]
VISUALS	
Site A	
1. Concerns about the visual appearance of the landfill when coming into city--will it be visible from the interstate?	4.11.2
2. Photos submitted from Donaldson, E. Helena overpass. Claims location of Site A in the paper is misleading. Homestead Estates has a petition of 179 residents in opposition to Site A.	2.3, 2.1.5.2
Site C	
1. Many new homes are being constructed in the area and a landfill would be visible. Also, it would be visible on U.S. Highway 12 and Canyon Ferry Road.	Not relevant[1]
Area D	
1. Problems with visual exposure--residents don't want to look at a landfill.	Not relevant[1]
Site E	
1. The entire length of York Road will become refuse-laden if the standard garbage truck is used while awaiting delivery of the enclosed haulers.	4.9, 4.9.1
2. In the EA, it states that: *Upon completion of the landfill, the site is scheduled to be appropriately contoured, capped, seeded, and returned to usable grazing land.* (EA page 17) The cited statement above summarily dismisses the aesthetics and visual impacts of the landfill on surrounding elevated areas that can view the landfill site.	2.2.6, 4.10.1, 4.11.1
3. I'd like to see a visual truck count of the size the city and county are expecting to use on different sections of the site E haul route from beginning to end. The same with site A.	3.9, 4.9
RECREATION	
General	
1. What about recreational areas and potential hazards?	3.10

TABLE A-1
(Continued)

Comment		Section(s) Where Addressed in Text
Site A		
1.	Concerns about joggers, bikers, and recreationists.	4.10.2
Site B		
1.	Recreational use of road (Mt City East Helena) not as great as purported at the public meeting of 9-28 (Site C also).	Not relevant[1]
Site E		
1.	The landfill is near a golf course.	3.10.1, 4.10.1
2.	Concerns about tourism (salmon fishery at Hauser Lake and bald eagle migration), Lake Helena, the new golf course, and the Regulating Reservoir.	4.10.1, 3.6, 3.6.4.1
3.	The county fairgrounds are likely to close due to the diversion of funds to support the landfill. Also, a severe reduction or termination of the county library is likely for this same reason.	4.12 for socioeconomic analysis; however, impact to fairgrounds and/or library not projected
TRANSPORTATION		
Site A		
1.	Would Jefferson County residents be able to use the route?	No roads would be closed
2.	Need 100% new road construction in Jefferson County--concerned about the cost of road maintenance for Jefferson County.	Site A is not in Jefferson County
3.	Concerns about the cost of transfer vs. individual haul.	4.12
4.	Route to Site A is used by kids at the Montana City school and at East Helena.	3.9.2, 4.9.2
5.	During snowstorms, it takes 24-48 hours before snowplows arrive on the roads.	3.9.2, 4.9.2
6.	The transportation route would be absurd--driving to the "Exchange" exit, back-tracking on a deteriorating frontage road, crossing I-15 or alternatively traveling through East Helena and across a series of railroad tracks of a very busy railroad.	3.9.2, 4.9.2
Area B		
1.	There will be access problems in the winter due to drifting snow.	Not relevant[1]
Area C		
1.	One option is to produce a straighter route from Helena to East Helena with two directions in.	Not relevant[1]
2.	There will be access problems in the winter due to drifting snow.	Not relevant[1]

TABLE A-1
(Continued)

	Comment	Section(s) Where Addressed in Text
3.	It is a direct haul by two alternative routes (Highway 12 or Canyon Ferry Road) without crossing a railroad or without any back-tracking.	Not relevant[1]
4.	Canyon Ferry Road has poor alignment, grade, width, and condition. It also has a bad accident history due to recreationists, dumpsters, public haulers, and school buses.	Not relevant[1]
Area D		
1.	There is a large volume of traffic on Canyon Ferry Road, with a lot of potential traffic concerns on certain roads.	Not relevant[1]
Site E		
1.	Concerns about increased traffic.	3.9.1, 4.9.1
2.	Limited public access would be helpful due to the number of vehicle trips and poor handling practices.	3.9.1, 4.9.1
3a.	Expensive safety modifications to York Road: - narrow shoulders - school children waiting on shoulder - limit hauling between 10 a.m. and 2:30 p.m.? - new Shopko facility - new facility at airport	3.9.1, 4.9.1
3b.	Transportation arteries must be secure and modified prior to digging the first hole at the landfill including: - resurfacing the entire stretch of York Road - widening and upgrading the bridge over Prickly Pear Creek - paving Lake Helena Drive - straightening the curve at Warren School	3.9.1, 4.9.1
4.	York has more than average accident rate for state highway. If accident rate increases further, mitigation measures required.	3.9.1, 4.9.1
5.	Alternate routes need to be laid out in case of flood.	4.9.1
6.	Road access to Site E is too steep of a grade.	4.9.1
7.	It's ridiculous that the people who live out by the proposed landfill will have to drive their garbage all the way into town just so that it can get hauled back out to the lake.	
8.	Benton Avenue--must cross multiple railroad crossing. Custer Avenue--pass by 4-Georgian school. Its narrow, deteriorating overpass can be slick in winter.	3.9.1, 4.9.1

TABLE A-1
(Continued)

	Comment	Section(s) Where Addressed in Text
9.	On page 25 of the section "Human Health and Safety Issues" in the EA, it states that a fully loaded tractor-trailer would exceed the spring load limitations but would be within the specified limits during the rest of the year. The two options cited in the EA for addressing this problem to "mitigate overloading York Road in the spring" include: (1) adding an extra axle to either the tractor or trailer units or (2) reducing the amount of garbage in the trailer and hauling partial loads. Where is the analysis on the impacts to the human environment caused by the additional trips under option 2? Where is the analysis on the economics as to the higher cost associated with "limiting hauling" during the spring?	4.9.1.5, 4.9.1
NOISE		
Site E		
1.	Concerns that Warren School will be impacted by the noise of landfill trucks as they go to and from the proposed landfill. Will there be any mitigative measures in the EA and license to reduce the noise pollution? On what basis did the Department determine that the noise and other impacts within the "Human Health and Safety Issues" section of the checklist only mandate a "moderate" rating?	2.2.5, 3.5.1, 4.5.1
2.	The noise-producing incidents on the residential units locate along Lake Helena Drive and Deal Lane will be "relatively loud, but of short duration". The EA goes on to state that this "short duration" will continue for "50 years". Under what method has the Department determined that this impact is "moderate" and not "significant"? How will those homeowners be impacted? How will their land values be affected? How will the use and enjoyment of their property be affected?	4.5.1, 4.12.1
SOCIOECONOMICS		
General		
1.	Concerns about who will pay for the landfill.	4.12
2.	The percentage of non-combustible garbage is higher than what was shown in the charts.	Not relevant[1]
3.	Concerns about a landfill in residents' backyard.	4.10, 4.12
Site A		
1.	Concerns about what kind of interlocal agreement is necessary.	Site A is within the jurisdiction of proposing County (Lewis & Clark)
2.	Is there a benefit to Jefferson County for taxes?	None predicted
3.	Who will provide law enforcement and at what cost?	4.12.2
4.	Concerns about depreciated property values.	4.12.2

TABLE A-1
(Continued)

	Comment	Section(s) Where Addressed in Text
5.	Costs to individual taxpayers for a transfer station.	Not assessed
6.	It is within the general area of the #1 area of development as identified and recommended by the joint City-County Planning Board's long range plan.	
Site C		
1.	Canyon Ferry Road won't be fixed for some time because funding is $2,000+ per year.	Not relevant[1]
Site E		
1.	Concerns about the proximity of the landfill to the population and the dumping of garbage onto the rural population. Furthermore, the EIS must contain certain county and regional population projections. The original study assumed 40,000 tons/year for life of site based on 1989 quantities. The county population is increasing as are solid waste quantities. The EIS must also project population and trip generation for planned development in areas adjacent to the various sites to be analyzed. For Site E, population must be projected for: - Fox Ridge Golf Course and residential development - West Shore, Hauser Lake - Spokane Creek - Black Sandy - Lakeside - Montana Power Property - Other planned developments	3.12, 4.12, 5.1
2.	Concerns about irrigation, agriculture, and winds.	3.3.2, 3.4.1
3.	Financial Assurance rules by EPA for correction of contamination should be implemented in a couple of months, but what if contamination occurs prior to the rule adoption?	No longer relevant[1]
4.	Increased taxes for taxpayers--county's estimate has been undervalued (informal opinions from DHES now estimate the start-up costs for the landfill now approximate $2,000,000, and not the $975,000 budgeted for next year) Need to know real costs of compliance with MEPA and Subtitle D. Also, what are the costs of an transfer station? Will the taxpayers get to vote on the road improvement measures or are the costs assessed?	4.12.1, Not relevant (transfer station), 4.9.1
5.	In addition to the start-up costs, there will be the costs of attempting to control seepage in the landfill due to the failure of the proposed site to have an environmentally-safe proper soil and soil depth.	4.12.1, corrective action cost not assessed
6.	Cost to human life (children, hunters, resort traffic).	Costs in 4.12.1, but human cost not calculated
7.	New homes near golf course may not be built and the city will lose revenue.	4.10.1

TABLE A-1
(Continued)

	Comment	Section(s) Where Addressed in Text
8.	Since the proposed site life has decreased from 100 to 50 years, this will double the costs.	Proposed life 91 years
9.	Site E was purchased prior to doing an analysis and getting state approval--therefore, it was a "prejudged" conclusion. Also, the loss of interest on the money spent could have been available to the county. Developing the area as a residential area shows more potential than putting in a landfill.	"Prejudgement" not assessed in this EIS; land use and costs in 3.10.1 & 4.12.1, respectively
10.	Developing the economic resources of the Helena area should be a priority--this is hindering economic development.	Not relevant[1]
11.	Concerns that public landfills are not fined, are not sued, and normally aren't shut down if they fail, whereas private landfill are responsible for any problems that occur.	2.1.5.2, 2.1.5.3
12.	The costs of fuel, maintaining York road and the feeder roads, maintaining and correcting additional traffic congestion unique to York Road, and the effects of large semi trucks while transporting waste over a lengthy distance must be extremely high, whereas transportation to closer landfill sites or sites with available rail transport would save at least $50,000 more per year. Also, there will be a $1,000,000+ cost of straightening the Warren School curve and additional costs of correcting other dangerous areas along York Road. Who is going to pay for all this? Has the County agreed in writing to reroute the road north of the school? When will this occur?	4.12.1, 4.9.1
13.	The EA fails to acknowledge compensation to injured residents and landowners. The EA also fails to acknowledge the lost county tax revenue.	4.5.1; lost revenue not relevant
14.	Who will pay for the cost of telephone poles to be moved along Helena Drive?	Unknown
15.	It is the duty of the Department under MEPA to list the specific government services that will be impacted as a result of the proposed landfill and the new regulations governing their operation. The taxpayers have a right to know how much this will cost and who will fund the increase in government services.	1.4, 2.1, 4.12.1
16.	What is projected garbage generation over life of landfill if other communities haul here?	5.1
17.	Litter and weeds in harvested grain and hay will heavily devalue the price of the commodity/crop. It's also difficult to pick up litter in mature fields without tramping a lot of crops down.	2.2.5, 3.7.3, 3.7.5.1
18.	I think the county would be eliminating a valuable tax base in the future. As Helena Valley, along with the golf course, develops and grows, the agricultural land will eventually become residential, which would increase the tax base.	4.10.1, 4.12.1
19.	If the County restricts waste hauling activities to one-half hour before and after school hours, are operational costs of the landfill going to be affected by this scheduling? How?	2.2.3, 4.9.1; impact on operational costs not known

TABLE A-1
(Continued)

	Comment	Section(s) Where Addressed in Text
20.	The EIS must compare existing property values with before and after values at Scratchgravel landfill. Economic impact must be quantified based on recreation development vs. landfill on county tax base and present property owners.	4.12, 4.12.1
Area F		
1.	The fire district is concerned about protection obligations.	Not relevant[1]
AIR		
Site A		
1.	Dust control/litter control for blowing trash.	2.3.2, 4.4.5
2.	Wind direction and speed by Site A at 20 mph will go to East Helena.	3.4.1
Site C		
1.	Prevailing wind would drift an odor and debris directly to homes to the Northeast and subdivisions along Spokane Creek.	Not relevant[1]
Area E		
1.	Concerns about dust problems due to wind direction and speed. No site specific wind direction data, site specific precipitation data, and data concerning "dust devils" is available.	2.2.5, 3.4.1, 4.4.5
2.	Concerns that the smell of the landfill will affect homes, recreation areas, and commercial areas.	2.2.5, 4.4.1, 4.5.1
3.	The EA states on page 20 of the Air Quality section that the applicant has agreed to "suppress dust near the houses and other problem areas with regular applications of calcium chloride which can reduce dust emissions by 85 percent". Is this an enforceable condition and stipulation in the EA and license? Have the homeowners all agreed to the applications of calcium chloride? Are there any impacts of calcium chloride? If so, what are they? Does the Department believe that this measure reduces the impact of the landfill on air quality to minor?	License not issues & mitigations for dust control not final; 2.2.5, 3.4.1, 4.4
4.	Concerns that there will be open burning -- how has the County acknowledged that open burning will not occur? Didn't the initial application state open burning will occur? Has the Department imposed this prohibition on burning through the EA or a license?	2.2.3, 4.4.2
5.	Litter can affect irrigation canal, ditches, Lake Helena, Hauser Lake, Holding Reservoir, homes, recreation areas, and fields.	2.2.5, 4.11.1.1, 4.11.1.5
6.	Under the subsection "Litter Control" of the EA (p. 18), it is stated that on "extremely windy days waste disposal will not be undertaken." What constitutes "extremely windy"?	3.4.1; "extremely windy" not defined
Area F		

TABLE A-1
(Continued)

Comment		Section(s) Where Addressed in Text
1.	Spokane Hills wind from the west will bring in pollutants.	Not relevant[1]
Area H		
1.	Concerns about the strong prevailing West winds that exist.	Not relevant[1]
WATER RESOURCES		
Site A		
1.	Could the spring area on the Miller property be affected by the landfill? (It supplies stockwater for Melvin Johnson).	Not directly assessed, but potential water quality impacts in 4.2.2, 4.3.2
2.	Any hydrogeologic studies for possible groundwater contamination?	4.2.2
Site C		
1.	This site is located at the head of a sloping bench that turns into a tributary to Spokane Creek and within a few miles ends up in the Missouri River. There were also several wells that would be directly affected. Liners run a constant thrust of puncture which would allow seepage into the groundwater.	Not relevant[1]
Site E		
1.	The water supply is very limited--concerns that the landfill will affect it.	3.2.2.1, 4.2.1
2.	A well may be present on Plymale property to the south. What would the effects be?	3.2.2.1, 4.2.1
3.	Where will the cover for garbage come from?	4.1.1
4.	Permeability of Site E?	3.1.2.1, 3.2.2.1
5.	What about the recharging area and the seismic area?	3.1.6, 4.1
6.	The testing done so far on groundwater is inadequate--backhoe found groundwater at 7-foot depth only a football field away from the proposed landfill.	3.2.2.1, 4.2.1
7.	Runon/Runoff issues.	4.3.1
8.	Liner and LCRS required by Subtitle D: - how deep should clay be in soils? - depth to groundwater - connection between aquifers and springs	3.2.2.1, 4.2.1
9.	No drilling or aquifer tests were conducted in the area where the largest plume of contamination would flow.	3.2.2.1, 4.2.1
10.	No aquifer test was performed at the dump site.	Correct, 3.2.2.1

TABLE A-1
(Continued)

	Comment	Section(s) Where Addressed in Text
11.	Too much reliability was placed on data derived from domestic wells rather than research wells.	Not relevant[1]
12.	This site will damage two groundwater resources--the Helena Valley and Hauser Lake.	3.2.2.1, 4.2.1
13.	I am assuming that a groundwater monitoring system will be established. What chemical parameters and constituents will be monitored?	2.2.5
14.	There are domestic wells (west and east), a stock pond (east), seeps, Cedar Creek (runs year-round and empties at Lakeside), and springs. There are also irrigation canals located both east and west of site, with ditches ultimately flowing into Lake and Lake Hauser: - major canal 254 feet from site boundary on southeast; 795 feet on north end - concrete conduit at 254 feet location-indicates history of heavy runoff during extreme events - settling ponds could well overflow during extreme events	3.2.1, 3.2.2.1, 3.3.1
15.	Will the Department really tolerate another environmental and water quality fiasco such as exists at the Scratch Gravel landfill site?	Not relevant[1]
16.	Doesn't the Department consider this potential impact on the ground-water system significant when it is "apparent that the ground-water system was not definable and the permeable sand/gravel units were potentially present within 20 feet of the proposed landfill base"? (EA, Water Quality, Quantity, and Distribution section, p. 12)	4.2.1
17.	The EIS must map surface runoff issues; example 1--Cedar Creek, along Deal Lane to point discharge into Hauser Lake through 36" culvert at Lakeside Marina.	3.3.1, 4.3.1
Area F		
1.	Would it affect the irrigation system?	Not relevant[1]

TABLE A-1
(Continued)

Comment		Section(s) Where Addressed in Text
Area G		
1.	Is there any groundwater contamination? Any cause for well replacement?	Not relevant[1]
Site H		
1.	Concerns about groundwater contamination.	Not relevant[1]
SOILS		
Site A		
1.	High risk for landfill, bedrock, slope, seepage (spring in area), clay bedrock/hard clay, shell bedrock.	3.1.2.2
2.	SCS indicates high constraints for landfill activities in soil types on Miller Properties.	3.1.2, 3.1.2.2, Table 3.1-1
Site E		
1.	SCS indicates high constraints for landfill activities in soil types on Miller Properties.	3.1.2, 3.1.2.1, Table 3.1-1
2.	What are the types of soils at the proposed site?	3.1.2.1, Table 3.1-1
GEOLOGY		
Site A		
1.	This site has more gravel and boulders and less clay.	3.1.2.2
Site C		
1.	This is not a flat area and has that advantage over most of the other sites.	Not relevant[1]
Site E		
1.	Concerns with sandstone, sand, gravel, and shallow wells.	3.1.2, 3.2.2, 4.2.1
2.	The Helena Valley has experienced earthquake shocks and tremors. There is every reason to suppose that there will be others in the future, yet the proposed site is located on top of a fault line.	3.1.6, 3.1.7.1, 4.1, 4.1.1
3.	To what extent will WCC be able to determine impacts and/or what is the impact of the unknown?	- ? -
4.	Does the Department feel that the County has committed to adherence with the slope-height/slope angle relationship for construction?	Final designs not yet developed or reviewed by DHES

TABLE A-1
(Continued)

	Comment	Section(s) Where Addressed in Text
5.	The second paragraph on Geology and Soil Quality, Stability, and Moisture of the EA (p. 4) states as follows: *All available bore hole data confirm the site as being geologically complex and any attempt to collectively use the data to define discrete water bearing units is likely to result in erroneous interpretations.* Does the inability to use the data to define discrete water bearing units present any issues to the Department regarding degradation of the aquifer? How does the Department reconcile this lack of knowledge with a rating of "minor" on the checklist for this category?	3.2.2, 4.2.1
6.	The third paragraph on Geology and Soil Quality, Stability, and Moisture of the EA (p. 4) states as follows: *Municipal solid waste disposal permanently changes the nature of the subsoils and surface soils in the area of waste disposal. In Montana biological degradation in a landfill generally proceeds at a very slow rate.* How can this impact be rated "minor" on the checklist? Does a "very slow rate" of degradation minimize the impacts or the Department's concerns? If so, how? How does the Department reconcile the rating of "minor" with the policy of MEPA to "fulfill the responsibilities of each generation as trustee of the environment for succeeding generations." (Section 75-1-103, MCA)	3.1, 4.1.1, 4.4.1, 4.4.5
WILDLIFE		
Site A		
1.	This site is prime antelope habitat.	3.6.5.2
Site C		
1.	Wild game is frequently seen on the property.	Not relevant[1]
Site E		
1.	Concerns about impacts on wildlife.	3.6, 3.6.5, 4.6.1
2.	The EA states in the Terrestrial and Aquatic Life and Habitats section that the new landfill will displace some small and large animals. This analysis needs to be expanded (bald eagles from Glacier to Canyon Ferry area). The conclusion reached in the EA was that the loss of acreage to wildlife is not considered to be critical because it has been managed for crop land and is not a unique or critical wildlife environment. Who developed this standard? Where can it be found? Is this the department's conclusion, or is this the county's consultant's conclusions? Who concluded in the checklist demonstrating the cumulative and secondary impacts of the proposed landfill that the impact would be "minor" on the terrestrial and aquatic life and habitants?	3.6.1, 3.6.2, 3.6.5, 4.6.1

TABLE A-1
(Continued)

	Comment	Section(s) Where Addressed in Text
3.	Also, "some larger animals may choose to relocate due to noise, traffic, and disturbance of forage." However, the Department of Fish, Wildlife, and Parks has not been asked to provide their analysis of the impact on wildlife habitat, although Section 75-1-201 (1) (c), MCA, requires the Department to consult with the agency having jurisdiction and expertise on the impacts involved.	1.4.4, 3.6, 3.6.5, 4.6.1
4.	The section in the EA which describes impacts to birds is confusing, with regard to the impacts of the proposed landfill site on bald eagles and peregrine falcons. Pages 2 and 3 suggest the landfill will attract scavenger bird species, who will ingest "toxic" substances and will be easy prey for the nearby bald eagle population. However, in the final paragraph of the section on birds, it is asserted that the proposed landfill will not affect the bald eagle population. These two conclusions appear to be contradictory. Furthermore, the impact can't be labeled "minor" if these endangered species will be impacted by the proposed landfill. The Department has an obligation, pursuant to section 75-1-201(1)(c), to consult with the U.S. Fish and Wildlife Service to determine: (1) how the landfill will impact these birds (2) whether or not licensing can even go forward (3) if there are any procedures that must be complied with at the federal level.	3.6.2, 3.6.4, 3.6.5, 4.6
5.	Kokanee Salmon spawn beneath the docks at Lakeside Marina in late fall. Pollutants could affect reproduction.	3.6.3, 4.6.1
ENGINEERING		
Site A		
1.	Concerns about how hazardous materials would be handled and disposed of. Will a leachate and/or liner system be used to contain the solids as well as the liquids?	2.3.2
Site E		
1.	What are the uses of the landfill areas after closure?	2.2.5, 4.10.1
2.	Expected development of site, transfer station, etc.	2.2, 2.7.1
3.	Where will the cover for garbage come from?	2.7.2, 4.1.1
4.	Concerns about liners, clay layers, monitoring wells, and pumps--what if they fail? Who is responsible and what do we do? Is a liner that is composed of "two foot thick compacted soil on the base and sides of the waste disposal areas" adequate?	4.2.1, 2.1.2.2, Table 2.1-1
5.	How much leachate will be generated during landfill operation? What is the likely composition of this leachate?	4.3, 5.1
6.	What is the holding capacity and location of holding ponds?	2.2.1.3
7.	Does the transfer station have enough capacity to handle storage during events like high winds, blizzards, and floods?	2.7.1

TABLE A-1
(Continued)

	Comment	Section(s) Where Addressed in Text
8.	What measures in the site's design will minimize the impacts to the springs in the vicinity? The degree of connection between the aquifer and the springs has not even been established.	4.2.1
9.	The EIS must analyze existing pavement design and bridge weight limits based on expected loads.	3.9, 4.9
10.	The EIS must evaluate feasibility of using clay cover material when wet-farm equipment cannot get into fields during wet periods.	2.2.2
ALTERNATIVES		
General		
1.	Alternative energy? Incinerator alternatives (including wood wastes)? Garbage recycling? How will it be implemented? Alternative haul routes?	2.1.3, 2.5
2.	What about using the land east of ASARCO that's been condemned?	See 2.1.5 for discussion of alternative sites selection
3.	Buying or renting land?	4.12
4.	Fort Harrison location? Private land/BLM?	Not relevant[1]
5.	Controls on pollution, hazardous wastes, etc.	2.3, 2.4, 2.5, others
6.	Evaluate feasibility of rail transport to alternative sites, including the possibility of railing garbage to Site A, taking Site E as partial payment for Site A, and the price of Site A being lowered.	Not assessed
7.	Look into recycling machine in Alaska.	Specific unit not evaluated; recycling part of Alternative 4
8.	Concerns that the siting consultants hired by the county could not really be objective due to the purchase of the land. Requests that WCC closely review prior siting work.	2.1.5, other resource evaluations; objectivity not assessed
9.	The EA fails to discuss the possibility of responsible alternatives. The EA admits: *It is not possible to state that other landfill sites exist in the area which would not require such engineered systems and the resultant large initial capital expenditures.* (EA page 22) This simply means that other more cost-effective alternatives are not or have not been clearly analyzed and explored. Furthermore, it is not clear what the words "in the area" mean. Properly considered alternative sites should be those that conveniently serve the geographical needs of the county, not those proximate to Site E. MEPA compliance is crucial and an EIS document must address impacts of all alternatives. The EA fails to discuss these alternatives:	2.1.5

TABLE A-1
(Continued)

Comment	Section(s) Where Addressed in Text
- Site A wasn't picked because it's in Jefferson County and the new zoning makes the site significantly smaller. But Site A is located by a smelter, cement plant, and a gravel pit--why was "E" picked over "A"?	2.1.5.2, 2.2.1.2
- SW disposal hierarchy must be considered--landfill is last alternative. As a matter of public policy, must step outside of application with respect to SW alternatives.	2.5
- Because Site F has many potentially favorable attributes (connection to a railroad spur and a favorable terrain not near any major waterways) it should be considered as one of the viable alternatives. The county's possible misrepresentation as to the availability of Site F should be thoroughly examined.	2.1.5.2
- Other proposed landfill sites (e.g. the Silver City site, Site F) would not bear the economic or environmental injury inherently in the risk of developing the Site E landfill. The comparative value of the other sites versus the presently contemplated cost of the site E landfill has not been adequately analyzed.	2.1.5.2, 4.12
10. Private proposals that are not discussed in the EA:	2.1.5.2, 2.1.5.3, 2.5
- allow an already licensed landfill to serve the county's needs (Scratchgravel--expansion?)	
- transporting of refuse to an out-of-state, licensed disposal refuse facility (e.g. Great Falls or Missoula)	
- development of modern facilities to either recycle waste or turn it into energy	
- invest in an environmentally and technologically advanced waste disposal solution	Not addressed in EIS
- possibility of privatization of waste handling	
- a task force be assigned to look at locations that are environmentally as well as socially sound	
- building multi-county trash recycling facilities	
11. Using some "strategically located small container sites for County residents" for those people who have to drive to the Helena transfer station to dispose of their wastes.	**Possible mitigation?**

TABLE A-1
(Continued)

	Comment	Section(s) Where Addressed in Text
12.	Applicants were presented an alternative in which a private firm would haul to the Tenneson site. Some advantages are: - not starting another landfill - operators offered to exhume previously buried garbage and rebury with a synthetic liner - compliance with Subtitle D regulations - already permitted - private firm would assume liability - 6.5 miles from source center vs. 11.7 miles to Site E - transportation route is nearly all on federally funded, concrete, 4-lane highway vs. York Road - at a cost per ton 11% over the unrealistically low estimates of costs for site E - no need for transfer station -- plan called for direct hauling	2.1.5.2, 2.1.5.3, 2.4
13.	Waiting and relying on available interim solutions is an alternative that could save the county and its taxpayers substantial money and allow the opportunity to consider the long-term development of an environmentally better and economically affordable regional waste site.	4.12, 5.1
14.	One alternative that warrants consideration is to base the fees charged at least in part, if not totally, on the amount of waste handled.	4.12
15.	The impacts of the transfer station and Phases II and III should all be considered.	2.7.1
16.	The analysis is lacking in anecdotal input from people knowledgeable about Site E. Applicants have failed to collect a reasonable amount of this information, particularly the area's historical groundwater changes and complexity and weather patterns and extreme events.	2.1.4, Table 1.1-1
MEPA		
Site E		
1.	Montana's environmental laws require a comprehensive EIS (MCA 75-1-201). A failure to require one would constitute an abridgement of Montana's environmental laws.	Not relevant[1]
2.	Concerns about the cost of an EIS vs. Superfund.	2.6.2, 2.1.5.2
3.	Concerns about objectivity--need to be away from previous result oriented process.	Not relevant[1]
4.	It's important to realize that if local governments were not politically biased, the state of Montana would not need to enact its environmental protection laws. The state-mandated process of making an environmental impact statement requires a serious environmental analysis to ensure the environmental integrity of the state, aloof of politically-motivated decision-making.	1.3

TABLE A-1
(Continued)

	Comment	Section(s) Where Addressed in Text
5.	The EA does not meet the content requirements of ARM 16.2.626(2) and 16.2.628(2). The EA provides the Department with almost no information for its decision-making process. Furthermore, ARM 16.2.628(3)(d) and (3)(3) require an EA to include "an evaluation of the impacts, including cumulative and secondary impacts" on the physical environment and "human populations in the area affected by the proposed action". The EA on Site E totally fails to evaluate cumulative and secondary impacts associated with Site E.	Chapter 4.0
6.	Will the "non-degradation" policy of the Water Quality Act be violated? (Section 75-7-303, MCA).	4.2
VEGETATION		
Site E		
1.	Concerns about weed control during and after the landfill closes. What steps has the County proposed to control the spread of noxious weeds both at the site and offsite?	3.7.3, 4.7.1
2.	Effect on vegetation cover needs more detail. How does this impact compare with other alternatives?	4.7.1
3.	Does the Department feel that successful revegetation of the landfill site is possible under the operating plan proposed by the County?	4.7.1
4.	The second paragraph of the Vegetation Cover, Quantity, and Quality section of the EA (p. 3) states as follows: *Operation of the landfill site will dramatically effect vegetative cover across the site, particularly in the areas which are open and actively being excavated and filled with waste.* How does the Department reconcile this statement with a rating of "minor" on the checklist for this category? Is the Department requiring mitigation of this impact? If so, what?	4.7.1, 4.7.1.5
HEALTH AND SAFETY		
Site E		
1.	Concerns about liability/pollution insurance.	2.6.2, 4.9
2.	Difficulty with monitoring trucks--toxic chemicals could get into boxes at the transfer station.	2.2.3
3.	There have been previous problems with fire at Scratchgravel. What kind of fire control measures will be taken?	2.2.3, - ? -
4.	The economic consequences of the increased risks and irreparable harm to human life inherent from added congestion on York road and its tributaries.	4.9.1, 4.12.1

TABLE A-1
(Continued)

	Comment	Section(s) Where Addressed in Text
5.	Methane gas generated in sanitary landfills is a hazard to life and property. Proposals for control of methane gas are wholly insufficient. Will there be unsaturated zone monitoring for gases?	4.4.1, 4.4.5
6.	Will the entire site be fenced for security and safety precautions? What types of safety measures will be used?	2.2.3
7.	The EA does state that increased traffic passing the Warren School "could pose a serious safety problem for elementary school children without adequate precautionary measures." Upon what basis did the Department think that this was "moderate" and not "significant"?	4.9.1
8.	The EA states on page 25 of the "Human Health and Safety Issues" section that the Landfill Board should consider restricting waste hauling activities to one-half hour before and after school hours. Is this a requirement that is an enforceable condition in the EA and license? Or is it an action left to the discretion of the County Commissioners?	Enforceable mitigation and permit condition

[1] This response is used when (1) the question or comment does not require a response, or (2) the question or comment refers to a site not evaluated in full in the EIS, or (3) the question or comment is not relevant to the EIS process or issues being considered.

APPENDIX B
LANDFILL COST ESTIMATE DOCUMENTS

Cost Analysis and Projections for the Proposed Lewis & Clark County Sanitary Landfill
Prepared by Damschen & Associates
July 14, 1993
Prepared for Scratch Gravel Refuse District Board, Helena, Montana

TABLE 1

SITE E
CELL SEQUENCE SUMMARY

CELL NO.	WASTE CAPACITY (TONS)	ACCUMULATED WASTE CAPACITY	CELL ACREAGE	PREPARATION COST	CLOSURE COST	TOTAL	COST PER TON
1	64,000	64,000	8.0	$800,000	$400,000	$1,200,000	$18.75
2	113,000	177,000	6.6	660,000	330,000	990,000	8.76
3	169,000	346,000	8.7	870,000	435,000	1,305,000	7.72
4	161,000	507,000	4.4	440,000	220,000	660,000	4.10
5	60,000	567,000	4.5	450,000	225,000	675,000	11.25
6	184,000	751,000	6.1	610,000	305,000	915,000	4.97
7	231,000	982,000	6.1	610,000	305,000	915,000	3.96
TOTAL	982,000	-	44.4	$4,440,000	$2,220,000	$6,660,000	$6.75 (Avg)

TABLE 2

SITE E CELL SEQUENCE SCHEDULE (40,000 TONS/YR)			
YEAR	WASTE ACCUMULATION	CELL NO OPEN (COST)	CELL NO. CLOSED (COST)
1994 (DEC)	40,000	1 & 2 Open at Beginning	
1995	80,000		
1996	120,000		1 (400,000)
1997	160,000		--
1998	200,000	3 (870,000)	
1999	240,000		
2000	280,000		2 (330,000)
2001	320,000		
2002	360,000	4 (440,000)	
2003	400,000		
2004	440,000		3 (435,000)
2005	480,000		
2006	520,000	5 (450,000)	
2007	560,000		
2008	600,000	6 (610,000)	4 (220,000)
2009	640,000		
2010	680,000		5 (225,000)
2011	720,000	7 (610,000)	
2012	760,000		
2013	800,000		6 (305,000)
2014	840,000		

TABLE 3

SITE E CELL SEQUENCE SCHEDULE (45,000 TONS/YR)			
YEAR	WASTE ACCUMULATION	CELL NO OPEN (COST)	CELL NO. CLOSED (COST)
1994 (DEC)	45,000	1 & 2 Open at Beginning	
1995	90,000		
1996	135,000		1 (400,000)
1997	180,000	3 (870,000)	--
1998	225,000		
1999	270,000		
2000	315,000		2 (330,000)
2001	360,000	4 (440,000)	
2002	405,000		
2003	450,000		3 (435,000)
2004	495,000	5 (450,000)	
2005	540,000		
2006	585,000	6 (610,000)	4 (220,000)
2007	630,000		
2008	675,000		5 (450,000)
2009	720,000		
2010	765,000	7 (610,000)	
2011	810,000		
2012	855,000		6 (305,000)
2013	900,000		
2014	945,000		

TABLE 4

SITE E
CELL SEQUENCE SCHEDULE
(35,000 TONS/YR)

YEAR	WASTE ACCUMULATION	CELL NO OPEN (COST)	CELL NO. CLOSED (COST)
1994 (DEC)	35,000	1 & 2 Open at Beginning	
1995	70,000		
1996	105,000		1 (400,000)
1997	140,000		
1998	175,000	3 (870,000)	
1999	210,000		
2000	245,000		2 (330,000)
2001	280,000		
2002	315,000		
2003	350,000	4 (440,000)	
2004	385,000		
2005	420,000		3 (435,000)
2006	455,000		
2007	480,000		
2008	515,000	5 (450,000)	
2009	550,000		
2010	585,000	6 (610,000)	4 (220,000)
2011	620,000		
2012	655,000		5 (225,000)
2013	690,000		
2014	715,000		

Site E - Bond Size

Option A

Sources of Funds:		
Bond Proceeds	$3,240,000	
Earnings on Proceeds	$14,175	
Total Sources of Funds		$3,254,175

Uses of Funds:		
Land & Interest	$143,000	
Building	$80,000	
Scale	$40,000	
On Site Roads	$80,000	
Off Site Roads	$400,000	
Fencing	$40,000	
Ditchs & Ponds	$50,000	
Utilities	$10,000	
Methane Monitoring	$10,000	
Gate & Entrance	$10,000	
Consulting Fees to Date	$161,000	
Design & Inspection	$122,000	
Additional Consulting	$40,000	
Prior Costs	$150,000	
Contingency	$50,000	
Initial Cell Preparation	$830,000	
Second Cell Preparation	$690,000	
Costs of Bond Issuance	$30,000	
Establish Reserve	$316,023	
Rounding	$2152	
Total Uses		$3,254,175

TABLE 5

SITE E COSTS

1993 - 94

1. PERSONNEL	
Manager	20,000
Two Operators	66,000
Clerical, etc	2,000
Subtotal	88,000
2. OPERATIONAL	
Utilities Supplies	15,000
Road Maintenance	5,000
Litter Control	5,000
Engineering	5,000
Travel and Training	5,000
Insurance	10,000
Methane Monitoring	2,000
Groundwater Monitoring	15,000
State Fee	20,000
Administration	10,000
Subtotal	$92,000
3. EQUIPMENT LEASE	
Track Loader	30,000
Compactor	50,000
Scraper	60,000
Subtotal	140,000
Equipment Operating Costs	110,000
Closure and Post Closure	21,000
20 Year $3.25 Million Bond	260,000
Subtotal	$711,000
Cost/Ton (40,000 TPY)	$17.75
Liner & Cap Amortization (Cost/Ton)	6.75
Total Cost Per Ton	$24.50

Excludes interest earnings on reserves

TABLE 6

SITE E

COST COMPARISON
Dollars X 1,000

	YEAR					
	1993		2013		2014	
ITEM	E	WM	E	WM	E	WM
Personnel	$88		$128		$131	
Operations	92		134		136	
Equipment Lease	140		190		190	
Equipment Operations	110		160		163	
Post Closure & Fin. Assur.	21		31		32	
Debt Service (20 Years)	260		260		0	
Liner & Cap	270		400		408	
TOTAL	$981	$1,080	$1,303	$1,608	$1,060	$1,640
Cost/Ton	24.50	27.00	32.50	40.20	26.50	41.00

Site E Projections

July 14, 1993

Assumptions	
Inflation	2.00%
Volume	40,000 tons
Rate	$22.50

	FY 93-94 (Jan-July)	FY 94-95	FY 95-96	FY 96-97	FY 97-98	FY 98-99	$26 FY 99-2000	FY 2001	FY 2002
Expenditures									
Personnel	$44,000	$89,760	$91,555	$93,386	$95,254	$97,159	$99,102	$101,084	$103,106
Operations	$46,000	$93,840	$95,717	$97,631	$99,584	$101,575	$103,607	$105,679	$107,793
Equipment Lease	$70,000	$140,000	$140,000	$140,000	$140,000	$20,000	$160,000	$160,000	$160,000
Equipment Operation	$55,000	$112,200	$114,444	$116,733	$119,068	$121,449	$123,878	$126,355	$128,883
Closure & Post Closure	$20,700	$21,117	$21,535	$21,948	$22,553	$22,959	$23,354	$23,735	$20,335
Debt Service, Series 1993	$87,227	$261,755	$261,205	$265,205	$264,030	$262,842	$261,380	$264,992	$263,597
Debt Service, Series 1998						$105,000	$101,750	$103,500	$105,000
Debt Service, Series 2006									
Debt Service, Series 2008									
Debt Service, Series 2011									
Total Expenditures	$322,927	$718,672	$724,456	$734,903	$740,488	$730,984	$873,071	$885,346	$888,713
Revenue									
Tipping Fees	$450,000	$900,000	$900,000	$900,000	$900,000	$900,000	$1,040,000	$1,040,000	$1,040,000
Interest Earnings		$6,575	$15,691	$16,908	$14,210	$16,049	$15,381	$28,946	$21,373
Total Revenue	$450,000	$906,575	$915,691	$916,908	$914,210	$916,049	$1,055,381	$1,068,946	$1,061,373
Begining Balance	$0	$127,073	$314,976	$90,051	$272,055	$204,061	$389,126	$199,803	$383,403
Pit Expansion					($941,716)				($515,530)
Bond Proceeds					$700,000				
Periodic Closures			($416,160)				($371,633)		
Ending Balance	$127,073	$314,976	$90,051	$272,055	$204,061	$389,126	$199,803	$383,403	$40,533
Revenues less Expenditures	$127,073	$187,903	$191,235	$182,004	$173,722	$185,065	$182,310	$183,600	$172,660

July 14, 1993
(40,000 Tons)

					$28.50		$31			
FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
$105,168	$107,272	$109,417	$111,605	$113,837	$116,114	$118,436	$120,805	$123,221	$125,686	$128,199
$109,949	$112,147	$114,390	$116,678	$119,012	$121,392	$123,820	$126,296	$128,822	$131,399	$134,027
$160,000	$40,000	$175,000	$175,000	$175,000	$175,000	$50,000	$190,000	$190,000	$190,000	$190,000
$131,460	$134,089	$136,771	$139,507	$142,297	$145,143	$148,046	$151,006	$154,027	$157,107	$160,249
$21,101	$21,903	$22,744	$23,627	$24,553	$25,308	$26,852	$27,954	$29,000	$30,000	$31,000
$261,790	$264,465	$261,610	$263,207	$264,110	$259,435	$259,412	$263,251	$261,542	$259,166	$261,030
$101,250	$102,500	$103,500	$104,250	$104,750	$105,000	$0	$0	$0	$0	
					$82,500	$85,000	$82,250	$84,500	$86,500	$83,250
						$170,000	$169,000	$169,250	$168,500	$167,500
									$96,250	$93,250
$890,718	$782,376	$923,433	$933,874	$943,559	$1,029,892	$981,566	$1,130,563	$1,140,362	$1,244,607	$1,248,505
$1,040,000	$1,040,000	$1,040,000	$1,040,000	$1,040,000	$1,140,000	$1,140,000	$1,240,000	$1,240,000	$1,240,000	$1,240,000
$172,660	$15,002	$20,630	$17,574	$21,682	$16,841	$25,946	$32,868	$46,178	$28,708	$43,990
$1,212,660	$1,055,002	$1,060,630	$1,057,574	$1,061,682	$1,156,841	$1,165,946	$1,272,868	$1,193,822	$1,268,708	$1,283,990
$40,533	$362,475	$104,839	$242,036	$365,029	$483,151	$614,933	$799,314	$632,743	$482,056	$506,157
			($570,708)		($804,882)			($854,147)		
			$570,000		$1,100,000			$650,000		
	($530,262)				($290,285)		($308,876)			($444,327)
$362,475	$104,839	$242,036	$365,029	$483,151	$614,933	$799,314	$632,743	$482,056	$506,157	$97,315
$321,942	$272,626	$137,198	$123,700	$118,123	$126,949	$184,380	$142,305	$53,460	$24,101	$35,485

July 14, 1993
(40,000 Tons)

FY 2014	FY 2015
$130,763	$133,379
$136,707	$139,441
$190,000	$190,000
$163,454	$166,723
$32,000	$33,000
$0	$0
$85,000	$86,500
$166,250	$169,750
$95,250	$92,000
$999,425	$1,010,793
$1,240,000	$1,240,000
$28,601	$28,760
$1,268,601	$1,268,760
$97,315	$366,491
$0	
$366,491	$624,458
$269,176	$257,966

Letter to City of Helena Re: Bid for Solid Waste Disposal
From Mr. Ben Sale, Owner of CCSS Landfill
September 18, 1992

Ben's Truck & Equipment, Inc.
GENERAL ENGINEERING CONTRACTOR · LIC [illegible]
HAZARDOUS WASTE & TANK REMOVAL · ROAD BUILDING
P.O. BOX 732 · 2060 MONTGOMERY RD
RED BLUFF, CA 960[illegible]
916-527-5040 · FAX 916-527-[illegible]
BEN SALE
URT SALE

RECEIVED
SEP 21 1992
CITY OF HELENA
PUBLIC WORKS

September 18, 1992

RECEIVED
DEC 22 1993
MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID AND HAZARDOUS WASTE BUREAU

Kay McKenna, Mayor
City of Helena
City County Building
316 No. Park St.
Helena, MT 59623

Re: Solid Waste Contract

Dear Mayor McKenna:

As you know, at your Commission meeting earlier this summer, you selected Ben's Trucking as the preferred bidder for the interim solid waste contract. Since early June I have been attempting to finalize the contract with the City. In August I was suddenly informed that the City wanted to negotiate only a two year contract and was asked to submit a bid price for that. I submitted the best price I could and this week I met with Bill Verwolf, Dick Nisbet, and Ted Hill to discuss final changes to the contract.

At the conclusion of our meeting, the City Manager informed me that he would recommend that the Commission reject my proposal. Apparently, he intends to recommend that the City haul its waste to Great Falls until Site E is ready (assuming it is approved). Although my meetings with Mr. Verwolf and Mr. Hill have been cordial and professional, I would like to recap the following important points from our discussions:

Proposal of Ben's Trucking

-Once the City limited me to 2 years, I had to amortize the landfill costs over 24 months - something which both Bill Verwolf and Dick Nisbet acknowledged was necessary; the current price proposal is a "break even" price for me. If the contract were signed now, I would commit that, after the first two years, the price could be and would be appreciably reduced;

- The figure I recently gave to Mr. Hill of $36.70 per ton for two years is somewhat higher than my original bid of $32 per ton for a two year period; the increase is due to (1) changes in State regulations, (2) the City's insistence that all City waste had to be deposited in a lined cell whereas I had anticipated first depositing it in the current cell and then exhuming it and promptly reburying it in a lined cell (an approach ok'd by the State), and (3) lost revenues caused by a significant delay in commencement of services (my original bid contemplated that revenues would commence in August of 1992 as provided in the RFP);

- Bill Verwolf informed me of a possible perception that somewhere along the line I committed to build a transfer station (TS) and later dropped it with no change in price. This is not true. First, my initial proposal makes no reference to a TS. During negotiations, the City asked me to consider a TS and, at one informal meeting with the Commission, my representative Mr. Frink, apparently mentioned a TS. However, his reference was to an approximately $150,000 TS to be sited on City land which we had discussed with City staff as part of a _5_ year contract and was not _anything_ like the 1.9 million dollar TS currently planned by the City. If this misperception exists, it results from an unfortunate miscommunication among ourselves, staff, and the Commission.I have not backed out of anything.

Trucking to Great Falls

- I remain doubtful that the City can haul its waste to Great Falls for $38.25 per ton; the estimated $22 per ton for hauling to Great Falls is very optimistic and if the actual costs end up being even $4 higher (which is quite possible), the extra cost to ratepayers over two years between my proposal and the Great Falls option could exceed $325,000;

- For the Great Falls option, the City would need at least 2 tractors and three trailers and in two years these tractors would travel a combined total of about 500,000 (half a million) miles and would consume roughly 40,000 gallons of fuel - an environmental cost which could be avoided by using my site which is a mere 7 miles from Helena;

- Based on my 30 years in the trucking business, I must also express my concerns that return trips of the empty trailers (presumably 25-ton) in the wind/ice-prone area between Great Falls and Helena could well be hazardous to equipment and drivers, particularly in cold weather.

Other

- I have recently had two meetings, one with two homeowners from Sunnybrook and one with Jefferson County officials and have hopefully answered many of their questions about the current and future operation of the landfill. I intend to continue this communication in the hopes of demonstrating that a small, well run, Subtitle D landfill is the best approach to solving the modest needs of our local solid waste region, whether in the short or long term.

I remain very interested in a partnership with the City of Helena and so am very disheartened at the Manager's apparent decision to recommend against use of our facility which is located at Helena's doorstep. I recognize the complexity of your decision but wonder how the additional costs you may be asked to incur can be rationalized. I stand ready to meet your needs and am available to provide any information you may need. Thank you.

Sincerely,

Ben Sale, President
Ben's Truck and Equipment, Inc.

cc: City Commissioners
Bill Verwolf
Richard Nisbet
Ted Hill

SOLID WASTE TRANSPORTATION AND DISPOSAL AGREEMENT

By City of Helena and Waste Management of Montana, Inc.
May 10, 1993

SOLID WASTE TRANSPORTATION AND DISPOSAL AGREEMENT

This Solid Waste Transportation and Disposal Agreement ("Agreement") is made this 10 day of May 1993, by and between the City of Helena, Montana, ("Municipality") and Waste Management of Montana, Inc., a Delaware corporation authorized to do business in the State of Montana ("WMM").

WITNESSETH:

WHEREAS, Municipality desires to obtain transportation and disposal services for the economical and environmentally sound disposition of solid waste generated within its jurisdiction; and

WHEREAS, Municipality has the power to enter into service contracts for the transportation and disposal of solid waste; and

WHEREAS, WMM operates a transportation service and a sanitary landfill and desires to provide transportation, disposal and other solid waste related services.

NOW, THEREFORE, FOR AND IN CONSIDERATION of the respective covenants herein contained, the parties have agreed as follows:

ARTICLE I

Definitions

1.1 "Waste Material" means any and all waste that is solid waste, as the latter term is defined in Montana State law except Unacceptable Waste, as defined below.

1.2 "Delivery Date" means September 1, 1993 which is the date Waste Material is first accepted for disposal pursuant to this Agreement.

1.3 "Disposal Site" means the landfill permitted and operated by WMM near the City of Great Falls, Cascade County, Montana.

1.4 "Hazardous Waste" means any waste, (even though it may be part of a delivered load of waste) which:

(a) is required to be accompanied by a written manifest or shipping document describing the waste as "hazardous waste," pursuant to any state or federal law, including, but not limited to, to the Resource Conservation and Recovery Act, 42 U.S.C. § 7901, et seq. as amended and the regulations promulgated thereunder; or

(b) contains polychlorinated biphenyls or any other substance as storage, treatment or disposal of which is subject to regulation under the Toxic Substances Control Act, 15 U.S.C. § 2601, et seq. as amended and the regulations promulgated thereunder; or

(c) contains a "reportable quantity" of one or more "hazardous substances," as defined in the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. § 9601, et seq. as amended and the regulations promulgated there-under or as defined under Montana law and regulations promulgated thereunder; or

(d) contains a radioactive material the storage or disposal of which is subject to state or federal regulation.

1.5 "Municipality" means the municipal corporation for the geographical area comprising the City of Helena, Montana.

1.6 "Special Waste" means any waste, (even though it may be part of a delivered load of waste), which is:

(a) containerized waste (e.g., a drum, barrel, portable tank, box, pail, etc.) of a type listed in (c)-(h) of this definition, below;

(b) waste transported in a bulk tanker;

(c) liquid waste: For purpose of this paragraph, liquid waste means any Waste Material that is determined to be or contain "free liquid" by the paint filter test (EPA Method 9095). Sewage sludge from a publicly owned treatment works, shall be considered liquid if it fails to pass the paint filter test for solids;

(d) sludge waste;

(e) waste from an industrial process;

(f) waste from a pollution control process;

(g) residue or debris from the cleanup of a spill or release of chemical substances, commercial products or wastes listed in (a)-(f) or (h) of this definition;

(h) soil, water, residue, debris or articles which are contaminated from the cleanup of a site or facility formerly used for the generation, storage, treatment, recycling, reclamation, or disposal of wastes listed in (a)-(g) of this definition;

(i) residential wastes only if a change in law, statute, regulation, rule, code, ordinance, permit, or permit condition occurs after the Effective Date of this Agreement, requires special or additional management that differs from the requirements applicable on the Effective Date of this Agreement; or

(j) any Miscellaneous Special Waste as defined in Exhibit A.

1.7 "Suspicious Waste" is waste which WMM reasonably suspects may be "Unacceptable Waste."

1.8 "Taxes" means all real estate taxes and assessments, special or otherwise, levied or assessed upon or with respect to the Disposal Site, and ad valorem taxes for WMM's personal property located thereon and used in connection therewith. Should the state in which the Disposal Site is located, or any political subdivision thereof, or any other governmental authority having jurisdiction over the Disposal Site, impose a tax, assessment, charge or fee, or increase a then existing tax, assessment, charge or fee which WMM will be required to pay, either by way of substitution for such real estate taxes, or impose an income or franchise tax or a tax on revenues in substitution for, or in addition to, a tax levied against the Disposal Site or WMM's personal property, such taxes, assessments, fees or charges will constitute "Taxes" hereunder.

1.9 "Unacceptable Waste" means any and all waste that is either:

(a) Waste which is prohibited from disposal at a sanitary landfill by state, federal or local law, regulation, rule, code, ordinance, permit or permit condition;

(b) Hazardous waste, as defined in 1.4 above; or

(c) Special Waste without an approved Special Waste Agreement as described in Section 4. "Unacceptable Waste" shall not include residential waste unless residential waste is prohibited by a change in law which becomes effective after the Effective Date of this Agreement.

1.10 "Transfer Trailer" means 100-120 cubic yard capacity wheeled trailers with "live" floors capable of containing Waste Material while such Waste Material is being transported over public highways. Net weight maximum for each such trailer shall be 23 tons.

ARTICLE 2

Terms of Agreement

2.1 Effective Date. This Agreement will be effective upon execution, as used herein, the "Effective Date."

2.2 Initial Term. The initial term of this Agreement shall be for a period of one (1) year commencing on the Delivery Date.

2.3 Renewal Terms. This Agreement may be automatically renewed by the Municipality for one (1) additional one (1) year term (the "First Extended Term"), commencing at the end of the initial term. Thereafter, this Agreement may be extended for one (1) additional five (5) year term (the "Second Extended Term"). Municipality shall provide written notice of its intent to extend the term at least One Hundred Eighty (180) days prior to the expiration of the initial term or the First Extended Term. Municipality may terminate this Agreement at anytime, with or without cause; provided, however, that Municipality gives thirty (30) days written notice of its intent to terminate to WMM.

ARTICLE 3

Scope of Service

3.1 Construction. WMM has completed construction of the Disposal Site and performed all work necessary to make the Disposal Site operational and ready to receive Waste Material.

3.2 Operation. On and after the Delivery Date, WMM will accept at the Disposal Site all Waste Material not reclaimed or recycled that has been placed in Transfer Trailers by the Municipality.

3.3 Condition Precedent. WMM's obligations under this Agreement are expressly subject to the continuing effectiveness of all final, non-appealable licenses and permits that WMM deems necessary to operate the Disposal Site.

3.4 Exclusive Right. All Waste Material collected by the Municipality within the jurisdiction of Municipality that is directly or indirectly to be disposed of by landfill burial shall be placed in the Transfer Trailer for transportation to, and disposal at the Disposal Site pursuant to the terms of this Agreement. Municipality agrees, without limitation, that it will not enter into any franchise, license, contract or other agreement for the transportation or disposal of Waste Material with any party. Similarly, Municipality agrees, without limitation, that it will not enter into any franchise, license, contract or other agreement for the operation of a transfer facility, recycling facility, resource recovery facility or other alternative technology facility with any party unless there is a provision in such franchise, license, contract or other agreement requiring that all Waste Material from the transfer facility, recycling facility, resource recovery facility or other alternate technology facility be transported to and disposed of at the Disposal Site.

3.5 Holidays. The Disposal Site may, in the discretion of WMM, be closed on the following Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day.

3.6 Scale. WMM will have available at the Disposal Site, a scale or scales to weigh Waste Material that is transported to the Disposal Site. WMM will cause normal maintenance and calibration of the scales to be performed in accordance with manufacturer's recommendation. Municipality has the right once a month during normal working hours to enter the Disposal Site to inspect and to test the accuracy of scales. All transfer vehicles will be weighed in and out of the Disposal Site. Weigh-out will be optional if WMM has a tare weight on file for a vehicle.

3.7 Transportation Service. WMM agrees to lease to the Municipality Five (5) Transfer Trailers for a monthly rental of $100.00 each. WMM shall provide labor and equipment necessary to transport the Transfer Trailers from the Municipality's facility to the Disposal Site and return. Municipality shall provide labor and equipment necessary to move the Transfer Trailers within the Municipality's facilities. The monthly rental provided for herein shall be in addition to the Transportation Rate set forth in Article 5.1(A) below.

3.8 Compliance with Applicable Laws. WMM will comply with all present and future federal, state, and local statutes and ordinances regulating the transportation of Waste Material and the construction and operation of sanitary landfills for the disposal of Waste Material, and with all other rules and regulations and amendments thereto imposed by all federal and state regulatory agencies having jurisdiction over the transportation or disposal of Waste Material.

3.9 Nondiscrimination. WMM will not, in the performance of this Agreement, discriminate or knowingly permit discrimination against any person on account of sex, race, age, creed, color, national origin, political or religious opinion or affiliation.

3.10 Right to Refuse Unacceptable Waste. WMM shall not be required to accept, at the Disposal Site, any waste that WMM, in its sole discretion, considers to be an Unacceptable Waste. Any such Unacceptable Waste shall be returned to the Municipality at Municipalities cost.

3.11 Revocation of Acceptance. WMM may, at any time before the condition of the waste has been materially changed, revoke its acceptance of any of the waste discovered to be Unacceptable Waste. Revocation must occur within a reasonable time after WMM actually discovers or should have discovered the nonconformity. In revoking its acceptance of any waste, WMM shall notify Municipality of the manner in which the waste is nonconforming.

3.12 Title to Waste. WMM is vested with title to all Waste Material accepted by WMM at the Disposal Site. Any revenue or other value received by WMM as a result of reclamation, recycling or resource recovery shall be solely to the account of WMM.

ARTICLE 4

Special Waste Management

4.1 Requirement for Special Work Management. Municipality recognizes that Municipality, through the waste generators and Collectors, must manage responsibly any hazardous or Special Wastes in the solid waste stream. Municipality recognizes that the proper management of Special Wastes can be most effectively and efficiently achieved only by the accurate characterization and control of any Special Waste by the waste generator or Collector. Therefore, Municipality will require all waste generators and Collectors to participate in and implement a Special Waste program as described in this agreement. WMM will provide, upon request by the Municipality and without liability to WMM, assistance in training waste generators and Collectors for the proper handling of Special Waste.

4.2 (WMM's) Obligation Regarding Special Waste. WMM is not required to accept or manage any Special Waste unless it is specifically identified in a written Special Waste Agreement, approved in writing by WMM and any other person or company that handles the Special Waste.

4.3 Duty of Municipality. Municipality will require all waste generators and Collectors under its jurisdiction to execute a Special Waste Agreement prior to delivery of any special waste to the transfer facility. Municipality represents and warrants that neither it nor any waste generator or Collector within its jurisdiction shall deliver, arrange for the delivery of, or contract for the delivery of any Special Waste to the transfer facility without a fully executed Special Waste Agreement.

4.4 Special Waste Agreement. The specific requirements of the Special Waste Agreement shall be as specified from time to time by WMM and may be altered by WMM at any time as necessary to insure the proper management of Special Waste. At a minimum the initial Special Waste Agreement shall include:

(a) A representation of the character and regulatory status of the waste executed by the generator or Collector;

(b) A decision document executed by WMM and any other party that will manage the waste. A decision document shall at a minimum including the identification of the generator and the source and characterization of the waste;

(c) A proposed management plan for the waste, including any special handling requirements;

(d) The approval of WMM and any other party that will manage the waste indicating acceptance for handling of the waste; and

(e) The unit price associated with the management of the Special Waste. Unit prices for Special Waste shall be as set forth in Exhibit "C."

4.5 Representative Sample of Special Waste. WMM may, in its sole discretion, demand that a representative sample of any Special Waste proposed for delivery to the transfer facility be provided by the generator or Collector to WMM prior to the approval of a Special Waste Agreement. Unless otherwise agreed by WMM, the cost for acquisition, delivery and analysis of a representative sample shall be borne by the generator or Collector. If the generator or Collector refuses to provide a representative sample, WMM shall have no obligation to accept the Special Waste or to execute a Special Waste Agreement.

ARTICLE 5

Compensation to (WMM)

5.1(A) Transportation Rate. The rate to be charged for transporting Waste Material to the Disposal Site shall be $220.00 per Transfer Trailer load through June 30, 1994.

5.1(B) Disposal Rate. In addition to the transportation rate, the rate to be charged for disposal at the Disposal Site shall be $15.95 per ton of Waste Material through June 30, 1994.

5.2 Rate Escalation. On July 1, 1994, and on each July 1st thereafter, during the initial term or any renewal term of this Agreement, the rates set forth in 5.1 shall be subject to increase, the amount of which shall be calculated by adding to the rate for the immediately preceding year:

Annual Adder = [1.00 (CPI)] x Rate for proceeding year.

Where: CPI = the percentage change for the proceeding 12 month period in the Customer Price Index, the U.S. Department of Labor and Bureau of Labor Statistics.

If the index specified above is discontinued, the parties hereto shall agree by March 1st to substitute another equally authoritative measure of change in the purchasing power of the U.S. dollar for CPI.

As soon as practicable after June 30th of each year, WMM will determine the amount of the rate increases. The rate adjustment increase will be effective; retroactive to July 1st.

5.3 Additional Compensation. In addition to the adjustments in the rate specified in Paragraph 5.2, WMM will be entitled to additional compensation based upon the following events:

(a) Changes in Government Regulations Requiring Expenditures. The Municipality will also reimburse WMM for any expenditures required solely by federal, state or local law, regulation, rule, ordinance, permit or permit condition that becomes effective after the Effective Date of this Agreement and that was not imposed because of the action or inaction of WMM. WMM may amortize any required capital expenditures, with interest at then current rates for financing, over the remaining initial term of this Agreement. WMM may include any additional required operating expenditures as an adjustment to the Base Rate as adjusted.

(b) Tax Escalation. The Municipality will also pay to WMM an amount ("Tax Escalation Amount") equal to the amount by which the Taxes assessed in each tax year exceed the amount of all Taxes paid or accrued by WMM in the calendar year of the Delivery Date; prorated based upon the actual tons of waste delivered by the Municipality as compared to total tonnage accepted at the site. Within One Hundred Twenty (120) days of the Delivery Date WMM will provide Municipality a statement of the Taxes for the first calendar year. One-Twelfth (1/12th) of the Tax Escalation Amount will be added each month to the invoice to the Municipality.

(c) Fuel Tax Increase. The Municipality shall also pay to WMM an amount equal to the amount by which the taxes, fees or surcharges on motor vehicle fuel are increased over and above those which are in existence on the date hereof.

(d) Cumulative Compensation. Every adjustment to WMM compensation conferred herein will be cumulative and in addition to every other adjustment conferred herein.

5.4 Payment for Special Waste. Municipality shall pay WMM for disposal of Special Waste the unit price established by WMM. Unit prices will vary depending on quantity and quality of the waste

5.5 Billings. At the beginning of each calendar month, WMM will bill Municipality for all Waste Material delivered in the preceding calendar month by Municipality, pursuant to this Agreement. WMM will supply Municipality each month an invoice detailing the number of loads and the volume of Waste Material delivered for the preceding calendar month. Municipality will pay such invoice within thirty (30) days from receipt of the invoice, without further notice by WMM. A late charge of 1.5% per month will be imposed if the payment from Municipality is past due 15 days or more.

5.6 Books and Records. WMM will keep daily records of the weight or volume of Waste Material received and charges therefor, and Municipality has the right to inspect the same insofar as they pertain to the weight volume or number of loads of Waste Material received at the Disposal Site.

ARTICLE 6

Indemnity

6.1 Indemnification. WMM will protect, indemnify and hold harmless Municipality from and against any and all liability, or claims, arising out of the use of or occupancy of the Disposal Site or the transportation of the Waste Material, or any of the equipment or personal property required in the performance of this Agreement, except for occurrences caused by or arising out of the negligence or willful misconduct of Municipality, its officers, employees or agents.

6.2 Insurance. WMM shall provide and maintain Workers' Compensation insurance which shall meet the requirements of the State of Montana. WMM shall provide and maintain during the term of this Agreement, public liability insurance, to protect against claims arising out of WMM's operations that may result in bodily injury, death or property damage suffered on or about the disposal site or during the transportation of the Waste Material. The policy or policies in force shall contain a provision that the insurer will not cancel or decrease the insurance coverage without first giving Municipality thirty (30) days notice in writing. WMM, upon request, shall furnish Municipality evidence that the insurance required is in force. The limits of liability of all insurance required herein shall be as set forth in Exhibit B, which is attached hereto and incorporated herein.

ARTICLE 7

Default

Except as otherwise provided herein, if either party breaches this Agreement or defaults in the performance of any of the covenants or conditions contained herein for thirty (30) days after the other party has given the party breaching or defaulting written notice of such breach or default, unless a longer period of time is required to cure such breach or default and the party breaching or defaulting has given notice of its intent to cure or shall have commenced to cure such breach or default within said period and pursues diligently to the completion thereof, the other party may: (i) terminate this Agreement as of any date which the said other party may select provided said date is at least thirty (30) days after the elapse of the thirty (30) days in which to cure or commence curing; and (ii) have recourse to any other right or remedy to which it may be entitled by law, including, but not limited to, the right of all damage or loss suffered as a result of such breach or default. In the event either party waives default by the other party, such waiver shall not be construed or determined to be a continuing waiver of the same or any subsequent breach or default.

ARTICLE 8

Miscellaneous

8.1 Force Majeure. The performance of this Agreement by WMM may be suspended and the obligations hereunder excused or extended in the event, and during the period, that such performance is prevented, hindered, or delayed by a cause or causes beyond the reasonable control of WMM include, without limitation, default of another party; labor disputes, strike or lockout; acts of God; war; fire; explosion; national defense requirements; accidents; riot; flood; sabotage; lack of adequate fuel, power, materials, labor, or transportation facilities; power failures; breakage or failure of machinery or apparatus; damage or destruction of the Disposal Site and its facilities; injunctions or restraining orders; and judicial or governmental laws, regulations, requirements, orders, actions, or inaction, including the revocation or suspension of or failure to obtain, for reasons beyond WMM's reasonable control, any licenses or permits required for transportation of the Waste Material or operation of the Disposal Site. In the event of disruption of services under any such circumstances, WMM will make every reasonable effort to resume services as soon as practicable after the cessation of the cause of suspension of services, and it will take all reasonable steps to overcome the cause of cessation of service.

8.2 Enforcement. In the event that there is a dispute between the parties, and either party brings an action to interpret this Agreement, or to enforce any right which such party may have hereunder, or in the event an appeal is taken from any judgment or decree of a trial court, the party ultimately prevailing in such action will be entitled to receive from the other party its costs and reasonable attorneys' fees to be determined by the court in which such action is brought.

8.3 Right to Require Performance. The failure of either party at any time to require performance by the other party of any provisions of this Agreement will in no way affect the right of that party thereafter to enforce the same. No waiver by either party of any breach of any of the provisions hereof will be taken or held to be a waiver of any succeeding breach of such provision or as a waiver of any other provision.

8.4 Law to Govern. This Agreement will be governed by the laws of the State of Montana, both as to interpretation and performance.

8.5 Severability. If any provision of this Agreement is declared illegal, void or unenforceable, the remaining provisions will not be affected but will remain in full force and effect.

8.6 Headings. The headings used herein are for convenience only and are not to be construed as part of this Agreement.

8.7 No Assignment. No assignment of this Agreement or any right accruing under this Agreement will be made wholly or in party by WMM except to an affiliate, without the express written consent of Municipality. In the event of any assignment, the assignee will assume the liability of WMM, and such assumption of liability will relieve WMM of all liability under this Agreement. For purposes of this part, affiliate means any company that is a wholly-owned subsidiary of Waste Management, Inc., or of which Waste Management, Inc. or a subsidiary thereof owns at least fifty-one percent (51%).

8.8 Successors and Assigns. Subject to the foregoing restrictions on transfer and assignment contained in Paragraph 8.7, this Agreement will inure to the benefit of and will be binding on the parties hereto and their respective successors and assigns.

8.9 Specific Services. This is an Agreement for the performance of specific services described herein. Under no circumstances or conditions shall the operation of the Disposal Site by WMM in accordance with this Agreement be deemed a public function, nor has Municipality acquired an interest, ownership or otherwise in the real or personal property or improvements or fixtures at the Disposal Site by virtue of this Agreement.

8.10 Notices. All Notices or other communications to be given hereunder shall be in writing and shall be deemed given when mailed by registered or certified United States mail:

To Municipality:

City of Helena
Attn: William J. Verwolf, City Manager
316 N. Park
Helena, Montana 59623

To WMM:

Waste Management of Montana, Inc.
Attn: Bill Price, General Manager
3201 15th Street N.E.
Great Falls, Montana 59403

with a copy to:

Waste Management of North America, Inc.
Mountain Region
5660 Greenwood Plaza Boulevard
Suite 400
Englewood, Colorado 80111
Attn: Bill Jeffry
Associate Region Counsel

Any changes of address by either party shall be by notice given to the other in the same manner as specified above.

8.11 Entire Agreement. This Agreement constitutes the entire agreement and understanding between the parties hereto, and it will not be considered modified, altered, changed, or amended in any respect unless in writing and signed by the parties hereto.

8.12 Signature. If this Agreement should not be signed by Municipality within ten (10) days from the date of execution by WMM, this Agreement will automatically void and of no force or effect whatsoever.

IN WITNESS WHEREOF, the parties have executed this Agreement this 10th day of May, 1993.

CITY OF HELENA, MONTANA:

By: ____________________

Its: City Manager

WASTE MANAGEMENT OF MONTANA, INC.:

By: ____________________

Its: VICE PRESIDENT

STATE OF COLORADO)
) SS
COUNTY OF ARAPAHOE)

The foregoing instrument was acknowledged before me this 30th day of March 1993, by Robert P. Damico, Vice President of Waste Management of Montana, Inc., a Delaware corporation, on behalf of the corporation.

NAN L. POSTON

Nan L Poston
Notary Public

My Commission Expires: December 23, 1993

STATE OF)
) SS
COUNTY OF)

The foregoing instrument was acknowledged before me this 11th day of May, 1993, by W.J. Verwolf of City of Helena, Montana, a(n) ______ corporation, on behalf of the corporation.

Debbie Lomurk
Notary Public

My Commission Expires: 5-4-94

EXHIBIT A

(Miscellaneous Special Waste Definitions)
See PAP Manual or Attached Exhibit in Form Book

EXHIBIT B

Insurance Coverage Limits

Coverages	Limits of Liability
Workers' Compensation	Statutory
Employer's Liability	$ 500,000
Bodily Injury Liability except Automobile	$ 500,000 each occurrence $1,000,000 aggregate
Property Damage Liability except Automobile	$ 500,000 each occurrence $ 500,000 aggregate
Automobile Bodily Injury Liability	$ 500,000 each person $1,000,000
Automobile Property Damage	$ 500,000 each occurrence
Excess Umbrella Liability	$2,000,000 each occurrence

EXHIBIT C

Special Waste Disposal Rates

	Type of Waste	Rate
1.	Sludge Waste	$15.95 per ton
2.	All other Special Wastes	$31.00 per ton

Transportation rates shall be as set forth in Section 5.1 of this Agreement. The above rates shall be through June 30, 1994. Thereafter, they may be adjusted in accordance with the provisions of the Solid Waste Transportation and Disposal Agreement.

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